SOAP

and SANITARY CHEMICALS

MARCH 1950

You Can't Buy Anything Better . . .

SOLVAY

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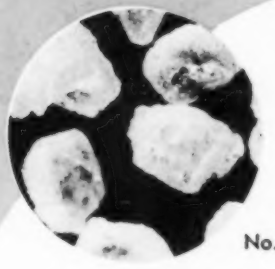

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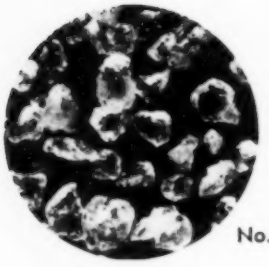

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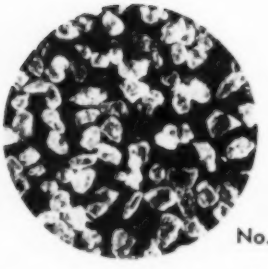

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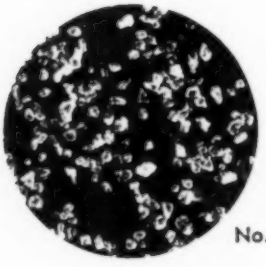

No. 9

Available in Small, Medium or Large Crystals for Repacking or Compounding in Crystal or Cake Form.

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ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

BRANCH SALES OFFICES

Boston • Charlotte • Chicago • Cincinnati • Cleveland • Detroit
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St. Louis • Syracuse

Soda Ash • Caustic Soda • Caustic Potash • Chlorine • Potassium Carbonate • Calcium Chloride • Sodium Bicarbonate • Specialty Cleansers • Sodium Nitrite
Nytron • Ammonium Bicarbonate • Para-dichlorobenzene • Ortho-dichlorobenzene • Monochlorobenzene • Methanol • Ammonium Chloride • Formaldehyde

Your PRIVATE BRAND

Your private label and Brand Name add your prestige to the products you sell. When you offer Private Label Merchandise, your integrity endorses each item.
An easily identified label is as personal as a handshake and is significant to the buyer. Your label represents integrity and consistant quality . . . . you get that, and *more too*, when you buy Fuld.

APPLICATORS AND APPLIANCES
CLEANING COMPOUNDS
DEODORANT BLOCKS
DEODORANT BLOCK HOLDERS
DISHWASHING COMPOUNDS
DISINFECTANTS
FLOOR SEALS AND TREATMENTS
INSECTICIDES
LIQUID CLEANERS
LIQUID, OIL AND BASE SOAPS
PLUMBING SPECIALTIES
POLISHES
POWDERED HAND CLEANERS
SOAP DISPENSERS
SPECIAL CLEANERS
TOILET ROOM CLEANERS
WAXES, LIQUID AND PASTE

ROUND UP PROFITS

Profits are realized in many ways . . . . Attractive , eye-appealing labels catch quick sales . . . . A favorably remembered label which conjurs pleasant memories of excellent product performance develops repeat sales. Round Up Profits based on the consistant quality of Fuld Bros., Inc. products and the integrity your name represents.

DESCRIPTIVE PRICE LIST

A really complete line of Sanitary Maintenance Chemicals is available to you. Write for our up-to-the-minute price book which contains a detailed description of each product.

QUALITY PRODUCTS SOLD EXCLUSIVELY TO RECOGNIZED JOBBERS

FULD BROS., Inc.

702 South Wolfe St. Baltimore 31, Md.
Los Angeles Calif.

Manufacturers of Sanitary Maintenance Chemicals

KEEP WHITE SOAP WHITE with Monsanto Ethavan and Coumarin

Monsanto Ethavan and Coumarin, when used as fixatives for perfume oils, keep white toilet soaps *white*... even when they're exposed for long periods. Economical Coumarin Monsanto and Ethavan amplify perfumes and make them permanent.

Get Ethavan and Coumarin Monsanto from your aroma supplier. Mail the coupon for one-ounce samples and data. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1731-A South Second St., St. Louis 4, Mo.

Ethavan: Reg. U. S. Pat. Off.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

MONSANTO AROMAS AND FLAVOR CHEMICALS

COUMARIN MONSANTO

ETHAVAN
(Monsanto's ethyl vanillin)

METHYL SALICYLATE, U. S. P.
(Monsanto's synthetic oil of wintergreen)

VANILLIN MONSANTO

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CHEMICALS AND PLASTICS

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Please send, without cost or obligation, quotations, data and samples of Ethavan and Coumarin Monsanto.

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City..... *Zone*..... *State*.....

SERVING INDUSTRY...WHICH SERVES MANKIND

SOAP and SANITARY CHEMICALS

Volume XXVI
Number 3
March 1950

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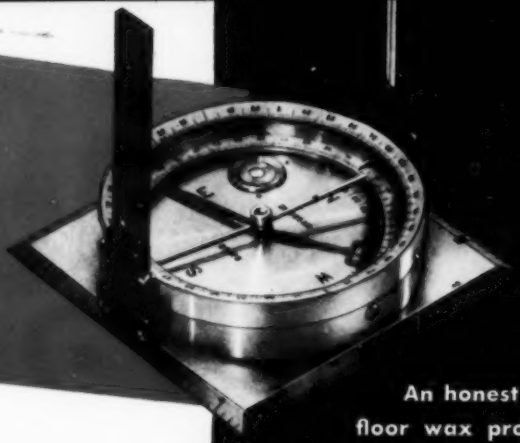
A GUIDE

TO WAX PRODUCTS PURCHASING FOR PRIVATE BRAND RESALE



An honest appraisal of floor wax products as we see it is offered to guide wax buyers who want the best quality money can buy...

SELF POLISHING WAXES

Candy's Supreme—Candy's Supreme Special AS
Candy's DeLuxe—Bright Beauty

Four floor waxes that *are* all-around top quality for any given traffic condition. Each imparts the finest protection and beauty to floors for which they are best suited.

Bright Beauty FLOOR CLEANER

An outstanding material for removing even the heaviest wax film and dirt....Brings neglected floors "back to normal." The *right* cleaning agent to insure the most efficient floor maintenance.

Bright Beauty CREAM FURNITURE POLISH

A cream furniture polish that spreads easily, polishes without excessive effort and imparts a deep impressive lustre. Too, it permits *repeated repolishing* with a dry cloth saving reapplications time and again; truly a very economical polish of very highest quality.

Bright Beauty PASTE WAX

A paste wax that is properly blended and refined from excellent quality solids and solvents that produce the best drying time and thorough evaporation. A wax that is easy to handle, having "creamy" consistency and stability throughout its stocking and usage period.

Bright Beauty LIQUID (spirit) PREPARED WAXES

Complete line of spirit dissolved waxes that meet a wide variety of demands for durability, color and types of usages. Each its own "Dry-Cleaner," they keep a surface waxed with a superb protective coating necessary to many difficult surfaces such as certain floors (where adaptable), bars, wallpaper, etc.

Bright Beauty GLASS POLISH & CLEANER and SILVER POLISH

As a Glass Cleaner (pink color) it applies evenly with little effort, wipes off easily with neglible "powdering" and produces an undeniable "feel" of cleanness to glass that is actually true in fact. Different in color only as Silver polish, it imparts a highly desirable lustre to all silver *without* abrasion and can even correct the abuses of scratchy, "quick-polish" inferior products.

Bright Beauty DANCE FLOOR WAX

Basic advantages are freedom from "balling up," thus does not gather dirt and impregnate the floor with hard spots difficult to remove...also is free from dusty effects. Adds the protective quality to expensive ballroom floors that means more "floor-years" to users everywhere.

Bright Beauty Heavy Duty PASTE CLEANER

Really *cleans* and *scours* more effectively and quicker than most scouring powders. Depending on application, it can clean to perfection even painted walls to provide a suitable repainting surface. 100% active, free from excessive abrasive quality, it frees almost every surface from all forms of foreign matter to perfection.

Bright Beauty SHUFFLEBOARD WAXES

Few can really demand the right product—so get on the inside early with the waxes that will *always* meet the most highly skilled performers demands for "fast play" and steady performance—the paste wax to produce a "base" of exceptional hardness and durability—a powdered wax to keep game progress on an even footing; truly tops in quality that *fully protects the expensive playing surface!*

1. BEAUTY AND DURABILITY

should be considered together. Initial appearance is important, but for a waxed surface to remain beautiful it must be durable. Durability depends not only on resistance to the abrasion of traffic, but even more so on resistance to the collection of dirt and to discoloring traffic marks. Durability is really measured by how long the waxed surface maintains a nice appearance before the necessity of complete removal and re-waxing.

2. ANTI SLIP

qualities are necessary in a good wax as a matter of safety underfoot. This important quality does not necessarily require the sacrifice of beauty and protection which are the foremost original reasons for the use of a wax. Look for the proper balance—a wax film which is not excessively slippery yet which is not tacky and does not excessively collect dirt.

3. WATER RESISTANCE

is important, particularly when considering the possibility of wet traffic and the necessity for frequent damp mopping for the purpose of removing surface dirt. Overdoing this quality means greater difficulty in applying multiple coats of wax and may seriously increase the difficulty in removal when complete cleaning and re-waxing is necessary. Water resistance is important, but so is the quality of removability.

4. SOLID CONTENT

when expressed in percentage is not nearly as important as the *quality* of the solid content. When considering good quality, 12% of solids answers most needs for good planned maintenance programs. Two applications of 12% will give better results than one of 18%. However, the more concentrated material is useful for some programs of maintenance and particularly on "washed-out" floors, etc. Over-waxing should be avoided so that periodic complete removal will not be too difficult.

5. CARNAUBA WAX

is still the most important basic ingredient in our floor waxes. When refined and compounded with other important ingredients and "KNOW HOW," it aids materially in producing the most important features of a good floor wax...ALL AROUND QUALITY OF PERFORMANCE.

● ALL AVAILABLE FOR PRIVATE BRAND ONLY

We do not compete with our jobbers for consumer sales. We sell only to distributors, except for experimental accounts in Chicago essential to research.

Wax Specialists for over 55 years

Candy & Company, Inc.

2515 W. 35th ST., CHICAGO

it's time to change to...

JAVONELLA

PERFECT FOR PERFUMING...

- LAUNDRY SOAPS
- WASHING POWDERS
- LIQUID CLEANSERS
- POLISHES, ETC.

3 GOOD REASONS WHY IT ALWAYS PAYS TO USE JAVONELLA

- It's a manufactured article . . . free from the price fluctuations of natural essential oils such as Citronella, Sassafras, etc.
- Its high quality never varies, enabling you to manufacture uniformly dependable products.
- Always lower in cost than the natural oils, particularly now with citronella prices on the rise, its use results in production economies and higher profits without lowering quality standards.

WRITE FOR SAMPLE AND QUOTATION

AROMATIC CHEMICALS • ESSENTIAL OILS • PERFUME OILS • FLAVORS

FELTON CHEMICAL COMPANY, INC.
599 Johnson Ave., Brooklyn 6, N. Y.

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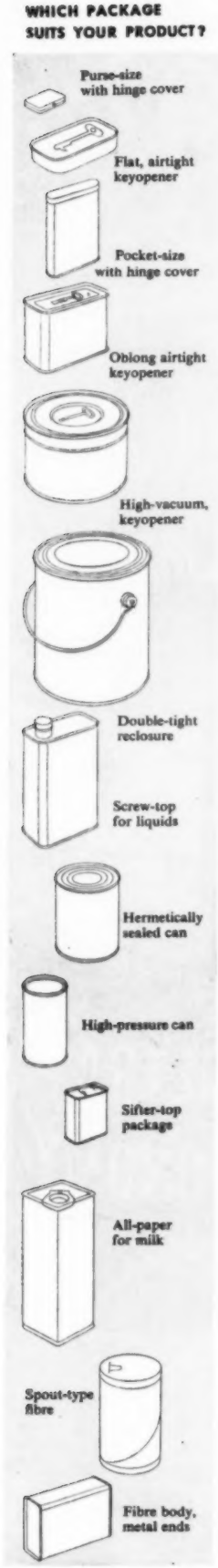
ST. LOUIS • CHICAGO • DALLAS • MONTREAL • TORONTO



If you are packaging small items used in small quantities...

This container is most familiar as the package for short lengths of adhesive tape used for minor cuts and bruises.

Notice that the hinged snap-top opens easily, protects the contents from dust . . . that the package makes a nice display and keeps clean after handling.

Perhaps you are packaging cold tablets, salt tablets, rubber bands, nails, nuts, bolts, playing cards, king-size cigarettes, whole spices, notions, buttons, *or some other small item used in small quantities.*

Might it not be a good idea for you and us to sit down together and see how our know-how might help you?

Pioneers, we . . .

Since 1901, Canco has been creating new and more effective packages. There is hardly a major development in the packaging field that this keen organization has not pioneered.

We can advise you on how to build sales, cut costs, improve processes, and on filling and closing procedures. We stand ready to serve you promptly in production-line emergencies. *Call Canco first!*

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Visit us, Booths 241 & 245, at the 19th AMA National Packaging Exposition, Chicago, Navy Pier, April 24-27.

wherever

PUT ULTRA QUALITY WAXES BEHIND YOUR PRIVATE LABEL

They sell . . . they repeat because they're better!

1. ***HIGH CARNAUBA CONTENT*** — Ultra waxes stand up longer . . . take tougher punishment because a rich Carnauba content — as high as 76%* in some formulations — provides this quality talking point.

2. ***UNIFORMITY CONTROLLED*** — Ultra uses the pick of the Carnauba crop, refined and processed in our own plants under carefully controlled supervision.

*Based on solid content.

Ultra waxes are perfect for linoleum, asphalt and rubber tile, wood, and cork floors.

They're different because they're SELF-LEVELING . . . SELF-POLISHING . . . MORE BRILLIANTLY LUSTROUS . . . NON-STREAKING . . . LONGER WEARING due to high Carnauba content. Write for samples, descriptive catalog and testing data sheets.

your location . . .

ULTRA shrinks your freight cost, speeds delivery with 3 strategically located manufacturing plants in . . .

North, south, east, west...wherever you're located in the U.S., one of Ultra's three plants is convenient to you — offering substantial freight savings and prompt deliveries.

This is one reason why the nation's largest distributors of world-famous private brands have depended on Ultra as a supply source for more than two decades.

NEW- A QUALITY WAX AT A SPECIAL ECONOMY PRICE

JO-12 — a new low-priced leader — can help you dominate the competitive market. It's eight ways superior —

1. Contains more pure Carnauba wax.
2. Its gloss nearly doubles with a second coat. Buffs easily.
3. Dried film is exceptionally free from streaks and blemishes.
4. Has superior wear resistance. Self-healing—becomes more lustrous as you walk on it.
5. Resists water spotting and withstands numerous moppings.
6. Has high anti-slip qualities listed by Underwriter's Laboratories, Inc.
7. Meets A. T. I. specifications and those of U. S. Government.
8. Is safe on any floor surface.

WRITE FOR FULL DETAILS!

ULTRA Chemical WORKS

ULTRA CHEMICAL WORKS, INC.

INSTITUTIONAL SALES

Los Angeles, California — Paterson, New Jersey — Joliet, Illinois

ULTRA DETERGENTS offer extra advantages to

. . . and the right synthetics for all your needs –

FLAKE . . . POWDER . . . SPRAY DRIED BEADS
LIQUID . . . PASTE . . . SLURRY

To gain maximum profits in today's highly competitive, highly specialized detergent field, your products must offer EXTRA advantages. Ultra provides the following advantages to help give your products extra sales push:

FLEXIBILITY

From Ultra's wide variety of physical forms and chemical types (many are listed on the opposite page) you may be able to choose one, or a combination, that is exactly *right* for your needs. Or special formulations can be created in Ultra's research laboratories to fit your special requirements.

FINE QUALITY

From start to finish, every Ultra product is checked thoroughly by a competent staff in a modern, well-equipped control laboratory. You are assured of consistent uniform quality to improve your products.

HIGH VALUE

Ultra's modern plant and staff of specialists are geared for volume production. You get top quality products plus all other Ultra advantages at no extra cost, enabling you to compete successfully in all price brackets.

What is your problem? If it lies in the synthetic detergent field, perhaps we can be of assistance in giving your products extra value. Why not write or phone today?

ULTRA Chemical WORKS

Tests show reduction of skin bacteria on hands with "DYSEPT" containing hexachlorophene

This new liquid soap perfectly meets the needs of surgeons, physicians, hospitals, clinics, restaurants—any application where it's important to maintain skin bacterial population at a minimum level. Independent laboratory tests demonstrate that convenient "DYSEPT"—with 5% hexachlorophene to the anhydrous soap content—is both bactericidal and bacteriostatic with continuous daily use. Charts show percentage reduction.

CHART No. 1. Percentage reduction in resident bacteria on hands with continuous daily use of undiluted "DYSEPT" for 4 consecutive days. Tests actually ran over 5-day period. "Zero" days represents bacterial population before use of "DYSEPT."

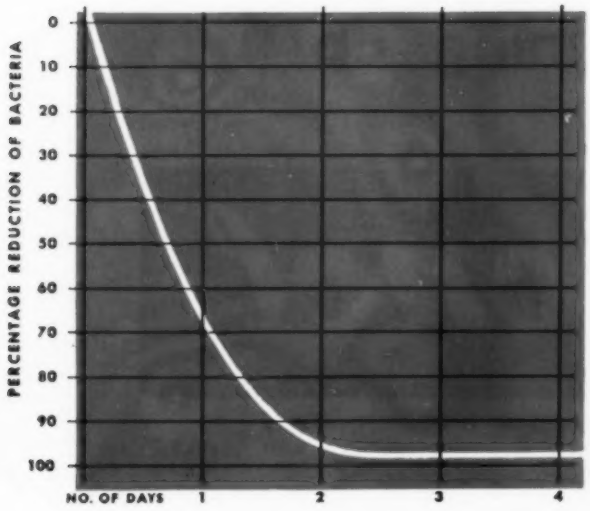
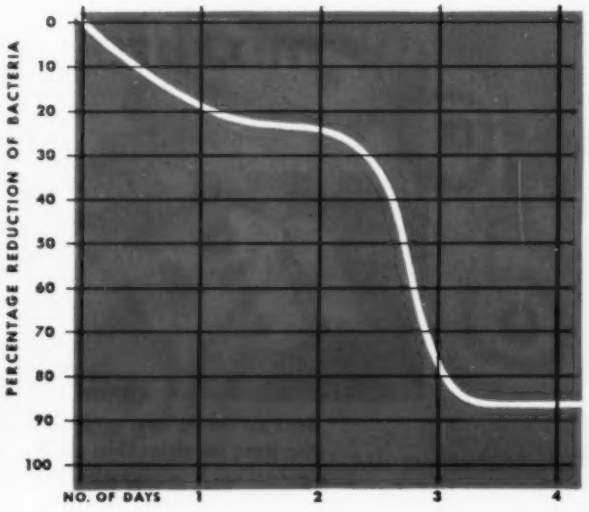


CHART No. 2. Percentage reduction in resident bacteria on hands with continuous daily use of "DYSEPT" diluted 1:1 with water for 4 consecutive days. Again, tests actually ran over 5-day period. "Zero" days represents bacterial population before use of "DYSEPT."



NOTE THESE FACTS ABOUT THE USE OF "DYSEPT"

"DYSEPT," containing 1% hexachlorophene to the total volume, leaves an invisible film not removed by rinsing which, with application one to three times daily for at least five days a week, reduces bacterial skin flora to about 5% of the usual amount and maintains that level. It has been found to reduce surgical scrub-up contact time with daily use. "DYSEPT" is non-toxic and non-irritating, and acts effectively even when diluted with water. A clinical brochure, with laboratory reports, suggestions for using and other technical data, may be obtained by mailing the coupon. "DYSEPT" is available through all Davies-Young distributors.

"DYSEPT"
with hexachlorophene
A product of
THE DAVIES-YOUNG SOAP CO.
DAYTON, OHIO

MAIL THE COUPON FOR SAMPLE AND DETAILS

THE DAVIES-YOUNG SOAP COMPANY SSC-350
BOX 995, DAYTON 1, OHIO
Please send free sample of "DYSEPT" and clinical brochure giving complete information.

NAME_____
ADDRESS_____
CITY_____
STATE_____

ANYWHERE

there's a **BIG TOUGH** mixture cleaning job

specify Nacconol*

AMERICA'S LEADING SYNTHETIC DETERGENT

Best value—alone or in mixtures—because NACCONOL delivers the best combination of:

EXCELLENT DETERGENCY	THOROUGH WETTING
FAST PENETRATION	HIGH STABILITY to Alkalis, Acids, Oxidizing and Reducing Agents
RAPID RINSABILITY	GOOD EMULSIFICATION
SUPERIOR DISPERSION OF MINERAL SALTS	HIGH EFFICIENCY AT LOW CONCENTRATIONS

ECONOMY IN HOT OR COLD SOLUTIONS OVER A WIDE pH RANGE

For prompt delivery, write, wire or phone our nearest office

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ALLIED CHEMICAL AND DYE CORPORATION

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Chicago 54, Ill., Merchandise Mart Bldg.	SUperior 7-3387	Chattanooga 2, Tenn., James Building	CHattanooga 6-6347
Philadelphia 6, Pa., 200-204 S. Front St.	LOmbard 3-6382	New Orleans 12, La., Cotton Exchange Bldg.	Raymond 7228
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*Reg. U. S. Pat. Off.

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A NORDA ORIGINAL

Your new odor's here. It's A NORDA ORIGINAL, ready for you to name it.

Use A NORDA ORIGINAL to start a line of products toward quick success. Every NORDA ORIGINAL has a modern, memorable bouquet—a spicy, lingering fragrance.

Plan a complete line — colognes, toilet waters, creams, perfumes, deodorants, lotions, soaps, lipsticks — with every item distinguished by A NORDA ORIGINAL.

Send for free samples of the smell that will sell your product. Just ask for A NORDA ORIGINAL. Come to Norda today.

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Norda ESSENTIAL OIL AND CHEMICAL COMPANY, INC.

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ALKATROL

CONDITIONER-CLEANER

gives bright life and safety to all surfaces underfoot

EXTRA FEATURE

This amazing CONDITIONER-CLEANER is now available with

CHLOROPHYL

in AIR-FRESHENING ODOR

Now—the entire floor surface becomes a giant dispenser that *automatically* air-freshens the atmosphere in the entire room area. It cleans! . . It revitalizes original lustrous surface beauty! . . It freshens the atmosphere! . . . all in one application.

Also available: SASSAFRAS, and MINT, or ODORLESS

Safe for the floor! Safe to walk on!

Listed by Underwriters' Laboratories, Inc., as an anti-slip floor treatment material.

With an ease of performance . . . this remarkable CONDITIONER-CLEANER revives original lustrous life of floor surfaces. It is amazingly effective on both oil and water soluble soil and scum—in any kind of water. Safe for all surfaces, because it is neutral balanced by exact control. And it cuts labor costs drastically, as it cleans bright—leaves no film or scum. Even slip-resistant wax, when applied to floors, gains you an extra assurance of safety and lustre, if the flooring surface is prepared beforehand with this versatile CONDITIONER-CLEANER.

Write today for samples and information

Chemical Service of Baltimore

HOWARD & WEST STREETS—BALTIMORE 30, MARYLAND

Manufacturers of quality waxes, soaps, cleaners, disinfectants. chemical specialties

SOAP PROBLEMS get in your hair?

Du Pont perfumer-chemists have been up to their ears in soapsuds for years! Results of their research and experience are yours in many quality Aromatics—both compounds and blends. Here are just a few:

PINE NEEDLE BOUQUET No. 2
A true pine needle bouquet

SPICY BOUQUET No. 40
Fresh, spicy note in a well-rounded bouquet

LAVENDER BOUQUET No. 49
A full-bodied lavender in demand for luxury soaps

JASMIN BOUQUET No. 16
An intense, especially desirable jasmin note (*For colored soaps*)

ROSE J No. 1
Light, appealing June rose fragrance

ORIENTAL 5 No. 60
Strong, warm and spicy character, with a suggestion of the Orient (*For colored soaps*)

These bouquets have been tested practically in many soap stocks—and selected for long-lasting properties and effective coverage of the soap. They are highly stable, properly fixed, and may be used as self-odors or as bases.

For more information or assistance on soap bouquets, write E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Dept., Aromatics Section, Wilmington 98, Del. Branch Off.: Atlanta, Boston, Charlotte, Chicago, New York, Philadelphia, Providence, San Francisco.

Du Pont Aromatics

DU PONT
REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

*greater whitening power with calcofluors**

These new products of Calco research give superior whitening power to all types of commercial and household soaps and detergents.

Calcofluors have these important characteristics:

1. Absorb ultraviolet light, without absorbing any appreciable amount of visual light.

2. Have good leveling characteristics (giving uniform distribution).

3. They effectively treat all types of fabrics.

4. Excellent fastness to hypochlorite.

Use coupon below to receive a copy of Bulletin No. 811, "Optical Bleaches in Household Soaps and Detergents", which gives helpful technical data.

*Trade-mark

AMERICAN Cyanamid COMPANY
CALCO CHEMICAL DIVISION
DYESTUFF DEPARTMENT
BOUND BROOK, NEW JERSEY

Calco

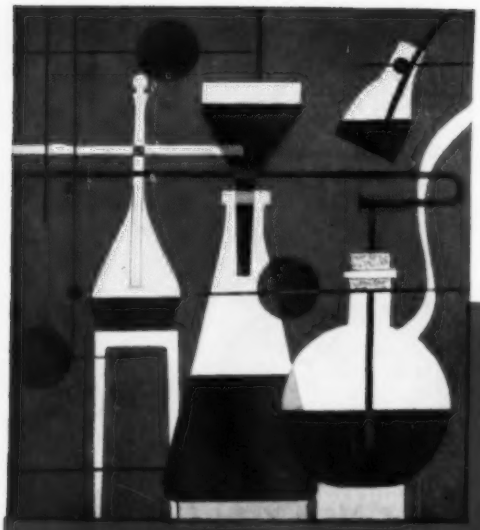
American Cyanamid Company
Calco Chemical Division
Bound Brook, New Jersey
Send me a free copy of your Technical Bulletin No. 811, "Optical Bleaches in Household Soaps and Detergents."

*Name*_____

*Position*_____

*Company*_____

*Address*_____



Today's Research...

STABLE — Free from odors caused by impurities, Verona chemicals carry through the life of *your* products without undesirable change in character.

ODOR NOTES in Verona aromatics—by prolonging the *scent* life of your products—work to your advantage at the point of sale. They please the prospective customer and add sales appeal to the soap, cream, powder, perfume or toilet water that contains them.

CYCLAMAL
ROSANOL
IONONES
FLORANOL
JASMINOL
AMUSKAL
RESEDALIA
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CINNAMIC ALDEHYDE

REMEMBER...
The Scent
Sells
The Product

Tomorrow's Success!

VERONA

AROMATICS DIVISION

VERONA CHEMICAL COMPANY

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commercially pure fatty acids...

(concentration of 90% or above)

Today, you don't have to buy a mixture of fatty acids to get the one you really want. Now, you can select a pure Neo-Fat fatty acid, tailor made to fit your exact needs. Armour's new chemical plant utilizes the Armour-developed *fractional distillation process* to separate crude fatty acids into their component acids, with a degree of purity never before possible (concentrations of 90% or above). This means you can now select the specific fatty acid you desire—without taking an equal or greater percentage of other acids which may contribute nothing to your formulation.

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Neo-Fat 7 (Caprylic Acid)

Mean Molecular Weight	145.7
Titer	13.0°C.
Iodine Value (Wijs)	0.8
Neutralization Value	385.0
Color...Water White	Odor...Characteristic

Typical Composition

Caprylic Acid	90.0%
Caproic Acid	3.0%
Capric Acid	7.0%

Neo-Fat 9 (Capric Acid)

Mean Molecular Weight	173.3
Titer	30.0°C.
Iodine Value (Wijs)	1.2
Neutralization Value	323.7
Color...White	Odor...Characteristic

Typical Composition

Capric Acid	90.0%
Lauric Acid	7.0%
Caprylic Acid	3.0%

Neo-Fat 11 (Lauric Acid)

Mean Molecular Weight	203.0
Titer	37.8°C.
Iodine Value (Wijs)	1.0
Neutralization Value	276.0
Color...White	Odor...Trace

Typical Composition

Lauric Acid	90.0%
Myristic Acid	9.0%
Unsaturated Acids	1.0%
Capric Acid	Trace

Neo-Fat 13 (Myristic Acid)

Mean Molecular Weight	226.0
Titer	37.8°C.
Iodine Value (Wijs)	2.0
Neutralization Value	248.0
Color...White	Odor...Characteristic

Typical Composition

Myristic Acid	90.0%
Lauric Acid	4.0%
Palmitic Acid	4.0%
Unsaturated Acids	2.0%

Neo-Fat 1-56 (Palmitic Acid)

Mean Molecular Weight	258.0
Titer	56.0°C.
Iodine Value (Wijs)	3.0
Neutralization Value	216.0
Color...White	Odor...Trace

Typical Composition

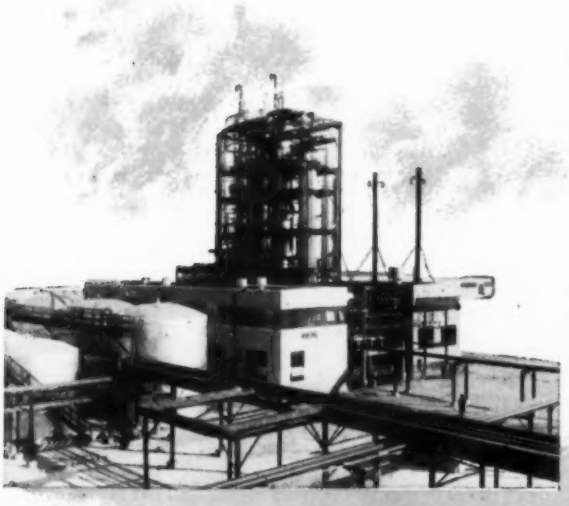
Palmitic Acid	90.0%
Oleic Acid	4.0%
Stearic Acid	6.0%

Neo-Fat 1-65 Stearic Acid

Mean Molecular Weight	282.5
Titer	67.0°C.
Iodine Value (Wijs)	3.0
Neutralization Value	198.0
Color...White	Odor...Trace

Typical Composition

Stearic Acid	90.0%
Palmitic Acid	6.0%
Oleic Acid	4.0%



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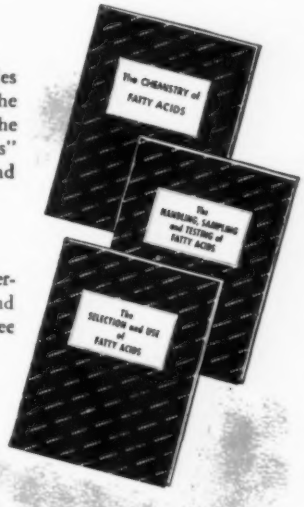

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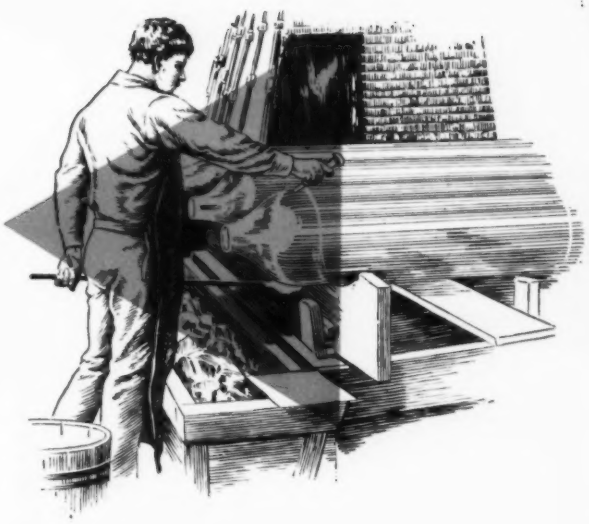

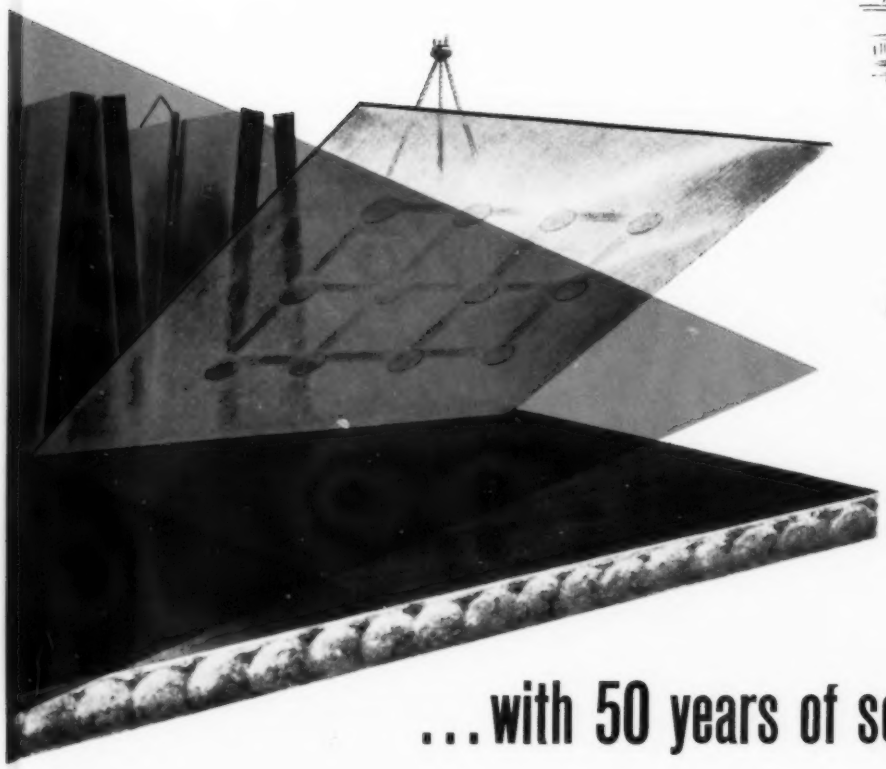

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Color 5¼" Lovibond Red	0.1 — 0.5	0.5 — 1.0
Color 5¼" Lovibond Yellow	1.0 — 2.0	2.0 — 3.0
Saponification Value	207 — 210	207 — 210
Acid Value	206 — 209	206 — 209
Iodine Value	3.5 — 4.5	5.5 — 7.0

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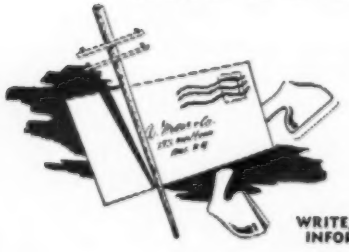
- √ **Highest Fatty Acid content.**
- √ **Reduced odor level.**
- √ **Greater stability in esterification and saponification.**



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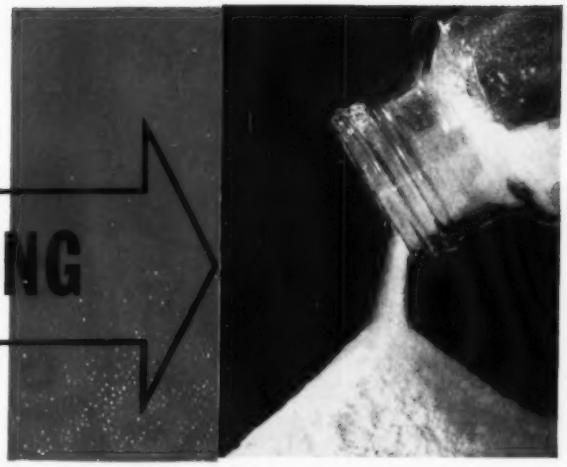

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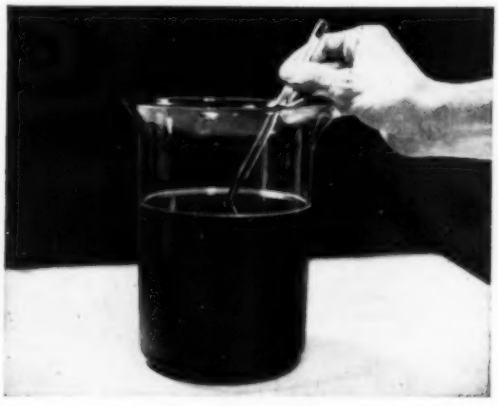

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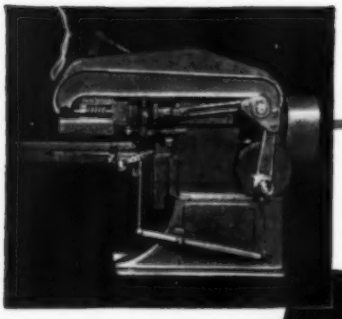
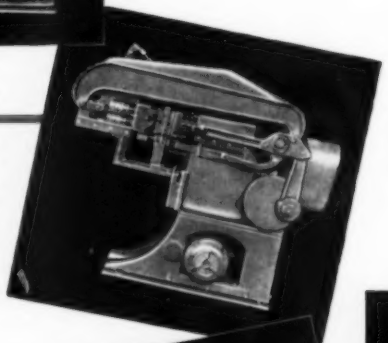


Type K Simplex Press

For toilet or laundry soap cakes of any shape (except highly convex cakes) with side band. Speeds of 120-140 cakes per minute.



Type K Duplex Press

Applications same as Type K Simplex. Presses two cakes simultaneously. Speeds up to 250 cakes per minute.

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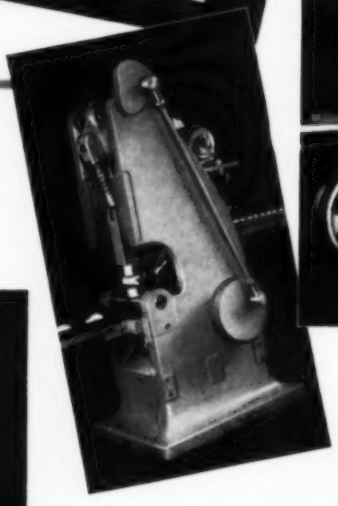
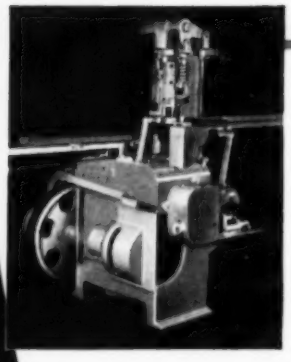


Type R Pin Die Press

For toilet soap cakes of unusual shape, oval cakes, or cakes having highly convex faces, with or without side band. Speeds up to 100 cakes per minute.



Type ET Press

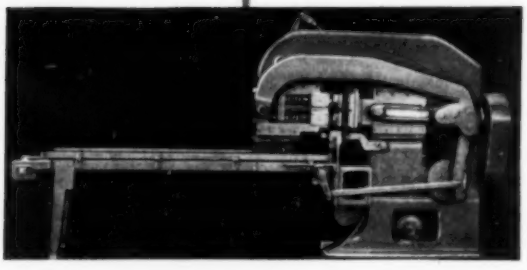
For small toilet soap cakes with side band. Speeds up to 120 cakes per minute.

Type F Press

For large toilet or laundry soap cakes. Available in Simplex or Duplex Models, pressing one or two cakes per stroke.

Type E Press

For small toilet soap cakes (1½ oz. or less). Speeds up to 200 cakes per minute.



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MANUFACTURERS OF JONES TOGGLE OPERATED SOAP PRESSES AND JONES CONSTANT MOTION CARTONERS

AS THE EDITOR SEES IT

WHAT is the trend in soap sales today? What has it been in recent years? While the majority of those who should be in a position to know,—if anybody really is,—state that the trend has been downward and still is, some evidence appears to contradict this contention. Specifically, fat and oil consumption statistics by soapers would indicate that over the past ten years, the average trend line has been upward. These statistics might also show that most estimates of soap production, particularly census figures, err on the low side.

One recent study showed a figure for combined soap and detergent production for last year over five billion pounds. Offhand, this appears high. Another report recently stated that "soap usage is continuing at close to the highest level on record." This, likewise, might be questioned. One estimate holds that soap consumption in 1949 was down about ten per cent from 1939, but that the slack was more than taken up by a consumption of seven hundred million pounds of synthetic detergents.

Ten years ago, per capita soap use was accepted to be about twenty-five pounds. If this figure were true then, we doubt that it is lower today. So when the experts and the statistics disagree, "you pays your money and takes your choice."

WHEN our good friend presented us with a few bars of the fanciest toilet soap we had glimpsed in many a moon, we were delighted. Upon opening the boxes,—they were packed one to a box,—we found a cake of soap which must have weighed close to a pound. It was the "giant luxury bar,"—and no fooling. The word, "giant," was in our humble opinion something of a gross understatement. An ostrich egg done in soap! Wondering where they grew human hands large enough to hold and use a bar of soap this size, we nevertheless undertook to get some lather out of this giant in the shower bath.

At about the third rub when the big lump of soap was nice and slippery, it squirted out of our grasp, bounced off the shower wall and landed with a dull thud on a very sensitive foot. It recalled the time a delivery truck cut the corner sharply and ran over our big toe. And the ensuing remarks about the mental capacities of the bird who had thought up this "giant luxury" thing definitely were not fit for print,—even here.

Adversity, they tell us, makes one appreciate more the little things in life which are so often just taken for granted. Well, this may or may not be true, but ever since we tangled with that "giant luxury bar," we have been very appreciative of the convenience of an ordinary three or four ounce bar of toilet soap. But, we are still wondering just how and by whom these ostrich eggs in soap clothing are supposed to be used.

NEW deodorant toilet soaps appear to be the current vogue. Not only in cake soaps, but in liquid soaps as well, hexachlorophene, which is Givaudan's G-11 bactericide, is finding wider use. Although Armour beat the market by a year or more with its "Dial," this apparently has not slowed down the marketing of new soaps of a similar type. Three new ones, including a G-11 liquid soap by one of the largest potash soap specialists, have recently put in appearance. Others are reported testing and test marketing in anticipation of joining the parade.

If imitation is the sincerest form of flattery, then Armour should be highly flattered. But, we have a hunch that the ringing of the cash regis-

ters as reported for "Dial" sales really has been the irresistible attraction. And if it keeps up, where is all the G-11 coming from? Givaudan owns the patent.

To a degree, we are reminded of the "health soap" market of some twenty years ago, when Lifebuoy was going great guns and every soaper this side of Singapore clambered on the band wagon. Color, odor, shape, all were dead ringers for Lifebuoy—that is until Lever knocked everybody's ears down with a rather broad court decision.

But today, it's different. Even though the new deodorant soaps all carry G-11 as the bactericidal agent, the similarity ends here. They are perfumed, colored and shaped differently. Nevertheless, we have a feeling that had "Dial" been a flop,—as was predicted for it by one or two of our alleged marketing experts,—these new arrivals on the scene would have been conspicuous by their absence today. 'Twas ever thus in retail marketing in this free country. If you would like new, active competition, written invitations are unnecessary. Just do a successful marketing job and it's ten-to-one that before you can turn around, there it will stand looking you squarely in the eye.

IF somebody offers you a bar of "Eskimo Soap," do not try to give little Petunia her morning bath with it. If we may go by all the talk, "Eskimo Soap" is in fact not a soap at all, but "oleo or oleomargarine" masquerading in sheep's clothing. And this "Eskimo Soap" label is just a dastardly trick to slip this greasy concoction past the laws restricting the sale of margarin. So excited have become legislators in some parts over the subject of "Eskimo Soap" that a bill has been introduced in the New York State Assembly banning the "illegitimate sale" of the product, and defining it as a product containing margarin ingredients, but not any of the "chemicals customarily integrated into soap," and colored to look like butter.

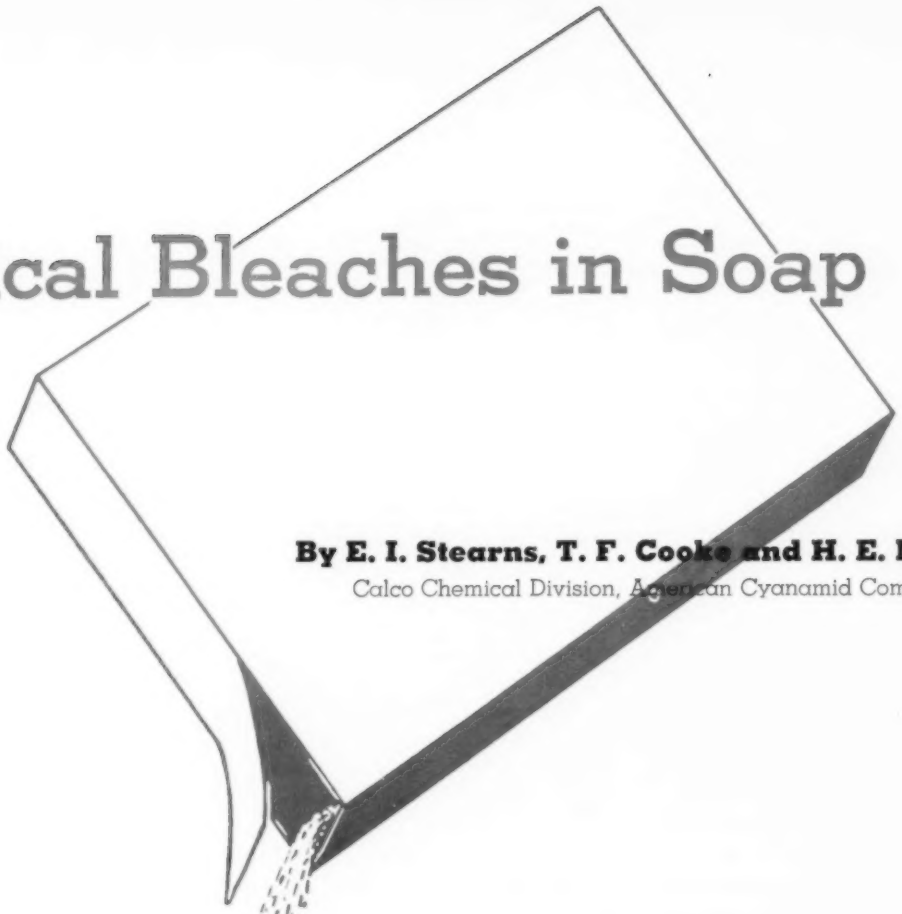
To date, we have not glimpsed a bar of "Eskimo Soap," but they tell us that it looks like butter, tastes like butter, and lathers nary one whit. Horrified that Mrs. McTrigger or anybody else might snip off a chunk and drop it in the washtub to scrub McTrigger's work pants, we rush into print with a warning. To our legislative hero,—surprise, he comes from a dairy county,—who has stuck his finger in this breach of the margarin dyke, we offer our congratulations on his alertness and his devotion to the public interest,—not excluding that of his dairy constituents. "Eskimo Soap," you are uncovered and your nefarious trickery exposed! Let that be a lesson to you.

BECAUSE coconut oil is not banned for import into the United States by order of the Secretary of Agriculture, like certain other oils and fats, the National Renderers Association along with two meat packers' associations has complained to the Senate Committee on Agriculture, according to Washington news reports. The basis of the complaint seems to be that coconut oil is used principally in the manufacture of soap and as such displaces inedible animal fats suitable for this purpose. And the renderers want to know specifically why the Secretary of Agriculture exempted coconut oil.

Obviously, this complaint to the Senate by the renderers is window dressing. The renderers know the answers about coconut oil in soap just as completely as anybody else. They know that soap produced from tallow and grease without some high lauric acid oil content such as coconut, is unsatisfactory and cannot meet quality standards of the American market. They know also that it does not displace inedible animal fats, but is a necessary supplement to their use in most soaps. And still they put a question to the Senate Committee to which they well know the answer. If it is not to put pressure on the Secretary of Agriculture, who refuses to bow to their will, what else could be its purpose?

As has been pointed out before, and apparently might be pointed out again if it would be heeded, the inedible fat producers of the U. S. will rue the day when they succeed in shutting off coconut oil from the American market, if they ever do. That would be the day when soap production and sales really hit the toboggan,—and synthetic detergents move in en masse to take over the market. It is something which the renderers to date have chosen to ignore.

Optical Bleaches in Soap



By E. I. Stearns, T. F. Cooke and H. E. Millson
Calco Chemical Division, American Cyanamid Company

THE SOAP industry, through its extensive research, is constantly striving to improve its product. One of the latest improvements in soaps and detergents is the incorporation of chemical compounds called whitening agents, brighteners, or optical bleaches for the purpose of making laundered fabrics whiter. These optical bleaches are fluorescent compounds that absorb ultraviolet light and emit visible light when they are applied to textile fibers. The greatest research activity has been centered on those optical bleaches which are applicable to cotton, although other textile fibers are now receiving considerable attention.

These brighteners can be classified as dyes, if we define a dye as a compound that is able to affix itself to a textile fabric and influence the apparent color of that fabric. They may even be called "white dyes." A great variety of optical bleaches has been synthesized in research laboratories, described in the patent literature, and offered commercially. The purpose of this article is to discuss briefly the physical and chemical properties of these new compounds so that the soap manufacturer may better understand their behavior.

PHYSICS OF OPTICAL BLEACHES

The Theory of Whiteness

The evaluation of whiteness has been the subject of considerable study in the past (4, 10, 16, 22) These studies have been based on non-fluorescent samples. Recently, several papers have been published on the subject of optical bleaches. (1, 13, 14, 18) These recent papers have been concerned with the physics and the chemistry of the fluorescent compounds which are suitable for imparting improved whiteness to fabrics.

No publications have yet appeared extending the theories of whiteness for non-fluorescent materials to include the new fluorescent optical bleaches. There seems to be no reason why the theory could not be so extended. The only difficulty might lie in the instrumental procedure of making color measurements by monochromating after illuminating. According to the theory, one sample may be whiter than another either because it appears to reflect more light or because the reflected light has more nearly the spectral composition as the illuminant.

Two of the problems of the instrumental evaluation of whiteness are to find 1) a suitable standard, and 2) the relative importance of an increase in reflectance to a neutralization of hue in effecting the improvement of whiteness. It has been found that observers differ in what they consider to be the ideal white. Furthermore, the same observer, making duplicate evaluations after a time interval

of a few weeks, may place a series of test samples in an entirely different order.

Nature of Discoloration

Most off-whites are yellow or gray. Yellow discolorations may come from many sources such as waxes, pectins, and other non-cellulosic components of natural cotton. Cotton may also turn yellow with age. Furthermore, when fabrics are washed with soap and not completely rinsed, some soap may remain and tend to yellow the fabric. While the amount of yellowness may vary, the hue of all of the above yellow shades is fairly constant. Described in terms of dominant wavelength (8) the hue of most of the yellow shades falls very close to 575 mu (16). In order to neutralize light of this nature, it is necessary to add the complementary color, that is, light having a wavelength of 473 mu, which is blue. The fluorescence light emitted by an optical bleach therefore, should have this dominant wavelength in order to change the yellow shade to white. Gray discoloration of fabrics results in a failure to reflect all of the light which strikes them and gives a general absorption over the whole spectrum. Gray shades may be due to a natural discoloration or to black soil. Grayness may be neutralized by the addition of white fluorescence light.

Fluorescence of Optical Bleaches

Fluorescent compounds which are useful as optical bleaches are able to absorb ultraviolet light and to convert it into visible light before it is re-emitted. These compounds must not absorb appreciable amounts of visible light, because by so doing they will impart color to the fabric and thereby decrease the whiteness. The fluorescent light which these optical bleaches emit is blue; however, there are many kinds of blue light. If light of 473 mu is taken as a standard, then blue light of longer wavelength may be described as greener than standard, while blue light of shorter wavelength which approaches spectral violet may be described as redder. In addition to hue, another variation in blue light is chroma. A pure blue light may be described as having a high chroma, whereas another blue light may appear to be diluted with a quantity of white light and may be described as having a low chroma.

Whiteness Standard

There is a standard white which has been adopted by physicists (11) for non-fluorescence colorimetric work. This standard consists of a freshly prepared surface of magnesium oxide, and was chosen because it reflects practically all of the light which strikes it. Compared to this standard, cotton muslin, which is often used for the evaluation of optical bleaches, has a reflectance of only 87 per cent.

Magnesium oxide, however, is not recommended for the visual evaluation of optical bleaches because, 1) it is non-fluorescent, and therefore derives all of its apparent whiteness from the reflection process, 2) the magnesium oxide has a different texture from the cloth so that it is difficult to make a quantitative comparison, 3) the housewife has never accepted it as her standard, and 4) not all people agree that this colorimetric standards of whiteness is the ideal white.

Because some people prefer slightly different whites, there is a variation in opinion as to the correct hue of an optical bleach. When light of 473 mu is added to a yellowish-white sample, the first effect is to neutralize the yellow shade; but if more of this blue light is added, the sample acquires a bluish-white color. Presumably, a bluish sample is considered to be off-white, just as a yellowish sample may also be considered to be off-white. Further, it has been found that a high concentration of some red-shade optical bleaches, or a number of successive washings in a soap solution containing a red-shade optical bleach will impart to the cotton fabric a pink tint.

Methods of Improving Whiteness

Chemical bleaches such as hypochlorites have been used for a long time by the housewife to improve the whiteness of fabrics, although excessive use may lower the tensile strength. Even after the maximum whiteness attainable by this method has been realized, it is still possible to increase the brightness further by the addition of an optical bleach. Chemical bleaches destroy the yellow color and therefore if optical bleaches are used simultaneously, those having a low chroma will generally produce the best results.

The blue dyes or pigments which are components of the conventional laundry blues produce their whitening effect by neutralizing the yellow cast of the fabric. These blue dyes or pigments are usually much less efficient than the optical bleaches because these bluing agents coincidentally decrease the total reflection of the sample, whereas the optical bleach increases the apparent total reflection, thus having a double whitening action.

The optical bleach is of especial interest to the soap manufacturer because it is the most efficient method of bleaching for daylight evaluation, and also because it is easily incorporated in the soap or detergent.

CHEMISTRY OF OPTICAL BLEACHES

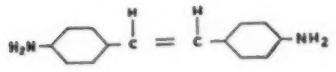
Necessary Characteristics

THERE are five main requirements for an optical bleach: (1) it must absorb ultraviolet light but not absorb appreciable amounts of visible light, 2) it must be applicable to textiles from a water solution, 3) it must be selectively absorbed by the material for which it is intended, 4) it must have an intense and a desirable shade of blue fluorescence, and, 5) it must meet certain fastness requirements, primarily fastness to hypochlorites.

When a chemist is asked to develop a new chemical compound to serve as an optical bleach, he has a wide field to consider. The following discussion shows a line of thought which he might pursue in developing a particular optical bleach.

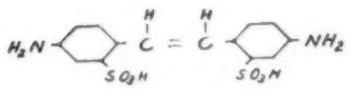
The first problem is to choose a chemical nucleus upon which to build. The wide choice available is evidenced by the fact that the literature on optical bleaches mentions at least ten different chemical classes of compounds. For the present discussion,

let the choice be diaminostilbene, one of the fundamental chemical nuclei from which a large family of optical bleaches has been derived. It is shown in Formula 1:



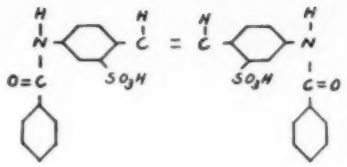
This compound absorbs ultraviolet light and very little visible light, thereby meeting the first requirement. However, its structure must be altered to meet the other requirements. For example, it will not dissolve in water.

A convenient way to obtain water solubility, and thereby meet the second requirement is to introduce sulfonic acid groups into the molecule. This results in Formula 2:



There are, of course, many other ways in which water solubility can be obtained. The position of the sulfonic acid group in the molecule can be changed and the degree of solubility can be varied by increasing the number of sulfonic acid groups. Other chemical groups, such as polyethylene oxide chains, or carboxyl groups, or quaternary ammonium salts can also impart water solubility and have been used in various optical bleaches (1).

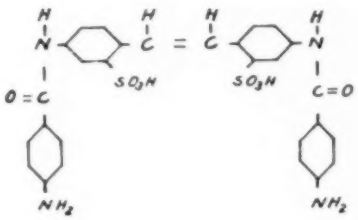
When cotton cloth is dipped in a solution of sulfonated diaminostilbene and not rinsed but allowed to dry, it will fluoresce. When the cloth is rinsed, all of the chemical is washed off and the fluorescence is lost. In order to satisfy the third requirement, it is necessary to introduce groups which, in combination with the original molecule, will impart substantivity. There are many ways to accomplish this result. One method is to add two benzoyl groups to give 4,4'-bis-(benzamido) stilbenedi-sulfonic acid. The structure of this compound is shown in Formula 3:



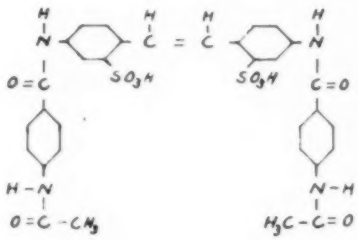
This compound is now beginning to fulfill the five requirements and has been mentioned in the literature as an optical bleach (15). However, in order to improve the flouorescence, and thereby meet the fourth requirement, substitution of an amino group in the para position of the benzoic acid ring may be made.

Other substituent groups may be used and their position in the ring may be varied to produce changes in the exact hue of the blue fluorescence.

This substitution gives the structure shown in Formula 4:



The compound shown in Formula 4 is subject to attack by hypochlorite. It is necessary to stabilize the amino groups, which can be done by acetylation. The resulting compound, represented in Formula 5, is an optical bleach with all five chemical requirements built into it. Formula 5:



The above description is greatly over-simplified. One of the complicating factors is that the various component parts added to the molecule generally influence all of the properties to some degree. For instance, when additional sulfonic acid groups are added to increase solubility, the substantivity to cellulosic fibers is reduced. The substituent groups which are placed on the benzoic acid ring in order to influence the shade of the fluorescence will also influence the substantivity of the compound. Nevertheless, the above example of a synthesis will serve to illustrate that there are a great many possibilities open to the chemist who is synthesizing optical bleaches.

This wide field of possibilities accounts for the fact that the soap manufacturer may be offered optical bleaches which vary widely in their properties. The need for a careful study of these products and a critical evaluation of their relative merits has been pointed out previously by McCutcheon (17).

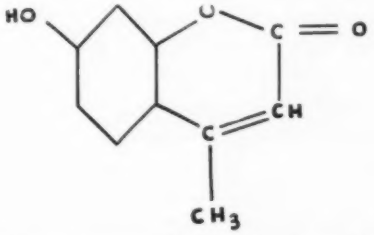
Classes of Optical Bleaches

Ten different chemical classes of compounds which possess optical bleaching properties of sufficient interest to warrant their inclusion in the literature are listed below. In each class there may be hundreds of individual compounds which have been prepared and evaluated in research laboratories. It is very likely that additional chemical classes are the subject of current research and that the list of optical bleaches will be increased.

The structural formula is given below of one example in each of these ten classes to illustrate the great variety of chemicals that have been tested.

1. Coumarin

One of the earliest observations of optical bleaching was recorded by Krais (12), who worked with chemicals of this class. One of the best-



known compounds in this group is beta-methylumbelliferone (Formula 6 above), which, while not substantive to

textile fibers, is widely used to whiten soap.

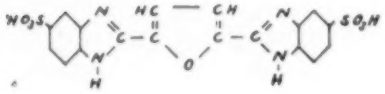
2. Diaminostilbene

One of the earliest optical bleaches which had substantivity for cotton belongs to this class (19). Its structure is given in Formula 3.

Other well-known members of this class include Blancophor R, the phenylcarbamyl derivative (20) and Blancophor B, the triazinyl derivative (20).

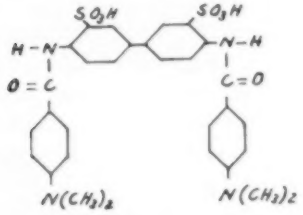
3. Benzimidazole

A cotton substantive material (7) of this class is illustrated by the following:



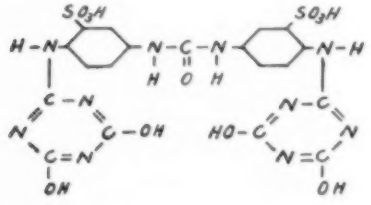
4. Benzidine

These cotton substantive materials were investigated early in Germany (1). An example follows:



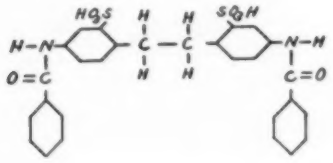
5. Diaminodiphenylurea

A cotton-substantive compound (3), of this class is illustrated by the following:



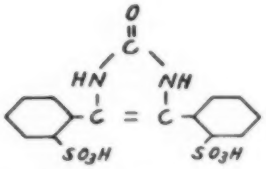
6. Diaminodibenzyl

A cotton substantive compound of this class follows:



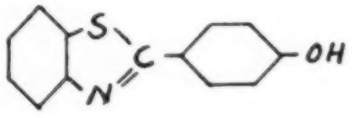
7. Diphenylimidazolone

One of the earliest optical bleaches which was substantive to wool and silk, and which belongs in this class is Blancophor W (20)



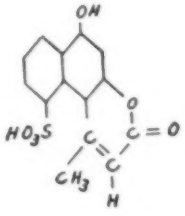
8. Phenylbenzothiazole

A cotton and wool substantive compound which belongs to this chemical class and which is used for printing "invisible" laundry marks (21) follows:



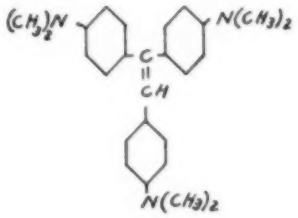
9. Benzocoumarin

A wool substantive material used for printing "invisible" laundry marks (21) belongs to this chemical class and its formula follows:



10. Tris-(aminophenyl)ethylene

A compound used for printing "invisible" laundry marks on wool and real silk (21) and which belongs to this chemical class is:



It is seen from the above that the chemistry and physics of optical bleaches is very complex. Consequently, it is highly desirable for the soap manufacturer to consult the dye manufacturer about the properties of the particular product under consideration.

(To Be Concluded)

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In Britain, secondary alkyl sulfates and polyethylene oxide condensates are the best established synthetic detergents. The secondary alkyl sulfates can be manufactured from petroleum sources on a large scale at an economical cost, as can also alkyl aryl sulfonates. These types are considered likely to comprise the major portion of synthetic detergents for some time to come. Technological advances will almost certainly take place in improvement of existing types, and in knowledge of suitable builders to bring out best performance. E. S. Paice, *J. Textile Inst. 40*, P876-90 (1949).

FLOATING SOAPS

By Milton A. Lesser

ORDINARY soap has an exasperating way of plummeting to the bottom of the tub, usually at the most crucial moment. Since it is heavier than water, this tendency to sink is natural to the soap. However, as is well known, by proper processing it is possible to prepare a soap that not only floats on water, but which will also have such desirable characteristics as fine, smooth texture, high lathering and cleansing properties, and long-lasting qualities.

Although it is said (1) that floating soap occupies a position midway between laundry and toilet soap, it is actually a quite versatile product. In many homes and for many years, floating soap was to be found in the bathtub and the wash basin, in the dishpan and in the laundry wash tub. For a number of decades, such soaps maintained a high order of multiple-use popularity, but recent consumer analyses indicate a shifting in the status of these products.

For example, a survey (2) of the Milwaukee market for 1948 showed that floating soaps had lost ground as detergents for dishes, for the household laundry, for washing fine fabrics and for walls, floors and woodwork. The statistics showed that this downward trend had been going on for several years. This, it should be noted, seems to be the general picture with respect to the use of bar soaps for such purposes; the more specialized flakes and beads taking their place.

In marked contrast, however, were the 1948 figures on the status of floating soaps for toilet purposes. In the greater Milwaukee area, consumer preference for bath soaps gave top rating to a floating soap. Between this brand ("Ivory") and another floating product ("Swan"), some 27.2 per cent of all families had given first choice to floating soaps (e.g. 22.0 per cent and 5.2 per cent, respectively). In the case of toilet soaps for the hands and face, a floating soap ("Ivory") held second place with 16.8 per cent of consumers giving it first choice. Another such soap ("Swan") was the first choice of 3.0 per cent of the purchasers. In all cases, the consumption of floating soap for toilet purposes represented an advance over the previous year. This increase was made, of course, at the expense of other types of toilet soap.

Making Floating Soaps

OVER the years, various methods have been devised for imparting floating properties to soaps. Such procedures fall into four broad categories. The first and by far the most important group of processes is that which serves to incorporate air bubbles in the soap mass by purely physical means. The second group includes methods whereby gas bubbles are formed in the soap, generally as a result of simple chemical reactions. The third class includes processes which depend upon the inclusion of light weight materials, while the last group of methods depends upon the insertion of cork, hollow bodies and other floating aids. From a study of the patent literature it is evident that variations and improvements in all of these methods are being suggested at rather frequent intervals.

Despite the multiple methods available to producers, practically all the floating soaps are made by incorporating air directly into the soap to reduce its density to below that of water so that it will float. According to such authorities as Martin (3) and Silman (4), these aeration methods permit a weight reduction of about 10 per cent in the finished soap.

The air trapped in the soap cake or bar affords certain advantages but also brings various disadvantages with it. The most obvious superiority of a floating soap is that its buoyancy keeps it on the surface of the water in full view of the user. Another advantage cited by Martin is the fact that the soap must be made of the best raw materials because any inferior or inert substances cause difficulty in aeration.

This authority indicates the other side of the picture by pointing out that, because of the occluded air, the soap presents a large surface to the solvent of water and consequently wastes rather rapidly in use. He also states that a floating soap is deficient in lathering properties. However, this last view is not held in all circles. Thus, in a government-sponsored consumer publication (5), it was conceded that floating soaps usually dissolve more rapidly, but it was also remarked that they sometimes make better suds than ordinary soaps.

Other experts (1) have pointed out that floating soaps are more sus-

ceptible to rancidity than ordinary soaps because the incorporation of air presents a surface subject to oxidation. This rancidity usually shows itself as yellow discolorations. Methods of combatting such changes depend on the proper selection and proportions of raw materials. For example, an increase in the amount of coconut oil is said to improve the color and lasting qualities of the soap. The addition of a stabilizer or anti-oxidant is also deemed advisable.

Perfuming Floating Soaps

OF interest in this connection is the observation (6) that the inclusion of an antioxidant likewise helps to stabilize the perfume. At the same time, it is stressed that the aromatic substances used in perfuming the soap must be chosen from those which are stable and do not cause discoloration. Thus, aldehydes such as citral, vanillin and cinnamic aldehyde should not be included in perfume compounds for aerated soaps because they tend to resinify and become dark colored in the presence of air and alkali. In a British publication, Arend (7) has remarked that a properly made floating soap for the bath can give a rich and pleasing fragrance. Alternatively, if indiscriminately prepared, the soap is liable to lack uniformity and to dissipate the perfume prematurely. However, it should be noted that the brands of floating soap most familiar to the American public are only faintly perfumed and are used not only for toilet purposes but also for laundering and dishwashing.

Most manufacturers aim at producing a floating soap of superior whiteness. Nonetheless, it is rather common practice to color soap made by the semi-boiled process, especially where scrap soap is included in the charge. When this is done, it is advisable to use soap-fast dyes; solutions of the coloring agent being added just before the perfume (1). From Arend's report, it would appear that bright colored floating soaps are quite popular in Europe. It is believed that the tinting helps to promote sales and a number of appropriate new colors have been introduced. Despite these innovations, the red-colored varieties are said to remain the most popular.

Because so many factors can influence the final results, the selection of the stock from which it is made, as well as the saponifying and finishing procedures, are most important considerations in the production of white floating soaps. As remarked by Stilman (4), floating soaps must be hard in texture to prevent them from dissolving too rapidly, but at the same time they should have good lathering properties. Hardness, says he, is achieved by using a good quality tallow as the main constituent of the stock, while the use of coconut oil improves the lathering power. The usual charge of the soap kettle, and one that is most satisfactory, is described (1) as containing from 65 to 75 per cent of tallow and from 25 to 35 per cent of coconut oil. In some cases other oils or hardened fats are used to replace part of the tallow.

The care that must go into the production of white floating soaps is also reflected in various standards and specifications. Thus, the Federal specification (P-S-616a) for a white floating toilet soap calls for a cake soap without objectionable odor, thoroughly saponified and so prepared as to float on water. They must contain at least 62 per cent of anhydrous soap with no more than 34 per cent of moisture and volatile matter. The acid number of the mixed fatty acids prepared from the soap must not be less than 212. Rosin, sugar and foreign matter must not be present. The sum of free alkali, total matter insoluble in alcohol, and sodium chloride should not exceed 2.0 per cent. Free alkali, calculated as sodium hydroxide, must not exceed 0.1 per cent.

Practically identical are the A.S.T.M. standard specifications for white floating toilet soap (8). Noteworthy in connection with these standards is the statement made in a recently-published consumer booklet (9). Here it is pointed out that the most floating soaps on the market are pure, neutral soaps of better quality than specifications require.

Although Martin (3) mentions that the aeration process for making floating soap originated in China some centuries ago, Stanislaus and Meerbott (10) give a much more recent date. In their chapter on the history of soaps they state that floating soaps were first introduced by the firm of Procter and Gamble of Cincinnati, Ohio. The story is told (11) that one day, some ten years after the Civil War, a careless workman permitted the soap crutcher to run during his lunch hour. This introduced minute air bubbles into the mixture with the result that the soap floated. This fortunate accident was investigated further and in October, 1879 the first cake was sold under the newly coined brand name, "Ivory".

The basic principle of crutching air into soap still persists. The soap may be made by one of the standard batch methods or by the newer continuous process. Where batch methods are used, a considerable proportion of floating soap is made by the full-boiled or settled process. The general procedure of this method is too well known to warrant repetition in this discussion. However it should be noted that, in large scale production, certain variations are employed in order to assure a more thoroughly saponified soap and one that keeps better. Thus, Silman (4) is of the opinion that the best procedure is probably to saponify the coconut oil and tallow separately, using an excess of lye. This is finally removed by graining out with brine to yield a practically neutral soap. Some soapers, it has been observed (1), maintain that the charge should be saponified after the coconut oil and tallow have been mixed together.

After the molten soap is taken from the kettle, it must be aerated by mechanical means. Minute air bubbles are incorporated into the hot soap by a specially constructed crutcher, by crutching at a high rate of speed or by reversing the direction of the screw several times during the crutching (12). Various types of paddle blades are used by different manufacturers to incorporate air into the soap. Thus, Arend (7) mentions that hook-shaped stirrers and paddles are utilized by some producers, but he feels that best aeration is obtained from the wire-brush type of stirrer.

American workers (1), however, are of the opinion that for general aeration of soap a vertical crutcher is probably the more satisfactory.

As noted by Snell (13), the mixing of air into the soap by the crutcher is frequently supplemented by blowing air in through small pipes located at the bottom of the crutcher. This air lowers the effective specific gravity of the soap to about 0.8 to 0.9. It is said (6) that the most satisfactory temperature for aeration is between 77° and 82°C., because in this range the soap is fluid enough to be whipped readily but yet viscous enough to retain the entrapped air. As the incorporation of the air continues, the soap becomes opaque and the volume increases. When density and temperature conditions are satisfactory, the soap is poured into frames to cool and solidify, a process which takes several days. Since some shrinkage occurs during this period, with the formation of a depression in the top of the soap block, it is common practice to place a weighted plank on the surface to keep it flat and lessen waste.

Following cooling and solidification to the desired extent, the sides of the frames are removed and the soap is cut into slabs and then subdivided into bars. The final steps, sometimes preceded by partial drying, are the stamping and wrapping of the soap bars.

Although incorporation of air into soaps to make them float is the most widely used method, there are several others. Whiteness of color is an important characteristic. Special equipment needed for continuous process.

Semi-Boiled Floating Soaps

FLOATING soaps may also be made by the semi-boiled process (14). In this method, both saponification and aeration take place in the crutcher, after which the air-containing soap is run into frames to cool and solidify. As is apparent from the following formula given in a widely-consulted text (1), a wider range of materials is used in making floating soaps by the semi-boiled process:

	lb.
Choice tallow	376
Refined cocoanut oil	127
Floating soap scraps	75
Caustic soda 35° Be.	275
Silicate of soda 40° Be.	10
Sodium hyposulfite, 50%	10
Perfume	2

The importance of scrap utilization in floating soap manufacture is a rather frequent subject of discussion. For example, in a description of the method employing the full-boiled process, it is noted (1) that the scrap from floating soap can be worked into the crutcher. It is stressed, however, that the quantity of scrap that can be returned in this way must not exceed 20 per cent of the weight of the soap in the kettle.

In the old days, it was quite common practice to make floating soap from soap trimmings, provided the scraps did not contain any fillers (15). Pertinent in this connection is the observation by Vallance (16) that cold-made floating soaps formerly consisted of remilled coconut soap scrap added to hot water. The resulting heated paste was then beaten up with a whisking device until the volume was doubled by the whipped-in air bubbles. The mass was then carefully poured into metal frames about six inches deep. Apart from any other considerations, Vallance remarked that such a method obviously presented pressing difficulties.

Another report (14) calls attention to the fact that one manufacturer prepared a framed floating soap by aerating a remelted cold-boiled soap that had been mixed with soap scrap. Of a similar nature is procedure cited by Arend (7). He mentions that certain producers who lack soap making facilities (e.g. perfumers) simply buy white curd or other soap cuttings, and have it beaten into a lather to yield a floating soap. The soap may be colored and is usually highly perfumed; yielding a luxury type of bath soap.

Soap experts (1) know that if aerated soaps are dropped into the frames at a too high temperature part of the air will escape. Such an occurrence will manifest itself as an uneven color in the soap block. Of interest, therefore, are the procedures developed by Ittner (17) to prevent these and other undesired effects. For example, to minimize contraction of the soap when it solidifies, aeration is controlled by the addition of air at a constant temperature to a known weight of soap. After a definite amount of air has been introduced into the soap, vigorous mixing uniformly distributes the gas throughout the mass in the form of extremely small bubbles. The semi-molten soap is then poured into frames and enough pressure is applied to reduce the volume of the soap to the volume it would occupy after solidifying. It is said that such a procedure prevents the excessive contraction that would otherwise occur at the center of the frame. In addition, the process improves the soap's whiteness and lowers its susceptibility to cracking.

Over the years, various other methods have been developed to improve aeration of floating soaps (18) or to improve their characteristics. In one rather interesting procedure developed by Hood (19), thin ribbons of milled soap are exposed to subatmospheric pressures which causes the interstitial gas to expand. This expansion of the trapped air makes the soap lighter than water and causes it to float. Methods for pressing the ribbons into cohesive masses are given in the patent.

Use of Gases in Floating Soaps

OF course, gases other than air may be used to give floating properties to soaps. For example, several patents (20), (21) have been granted for methods which make use of compressed oxygen to expand the volume of soap and lower its density to below that of water. In a noteworthy variation, Wilcox (22) advocated the addition of hydrogen peroxide to soap dur-

ing manufacture; the liberated oxygen causing the soap to float. In another case (23), the incorporation of chlorine gas was advocated to yield a soap which not only floats but which would be antibacterial as well.

Undoubtedly the most important new methods for incorporating air into soap are those employed in conjunction with the modern continuous soap making processes. Obviously it is beyond the scope of this discussion to go into a consideration of this revolutionary process for making soap from fatty acids by a continuous operation. However, as remarked by McBride (24), it may be noted that these methods not only yield the benefits inherent in continuous processing, but also provide such advantages as considerable time-saving and space-saving, improved color of soap, better glycerine recovery, increased flexibility of operation, and a reduction in the amount of materials tied up in the process.

By the continuous process, soap can be made in 24 hours as against about two weeks required to complete a batch in the kettle or boiled process (25). In addition, the process permits the accurate control of moisture content, free alkali and other characteristics. Thus finished soaps made by the new processes have a moisture content of 18 to 20 per cent as compared to 28 to 35 per cent for the framed variety (26). These and other elements also account for the fact that these methods yield a harder, whiter, longer-lasting and more generally satisfactory floating soap.

Equipment for Floating Soap

SPECIAL equipment for making floating soap by the continuous process has been developed by the leading soap manufacturers. It may be mentioned that there was litigation between two of these producers with regard to the patents on the special air-incorporating devices (14, 27). Noteworthy, too, is the fact that this disagreement was settled amicably a few years ago (28). One such aerating device, developed by Procter and Gamble, is known as the "Votator." The finishing procedure used by this organization begins by putting neat soap under a pressure of 700 pounds per square inch and heating to about 400°F. The soap is then released to a flash tank in which the moisture content is reduced to 20 per cent and the temperature to about 220°F. The hot, pasty soap is now sent to the Votator, which is a cylindrical cooling machine provided with scrapers to remove soap from the cooling surface. At this point, air is introduced to change the density to the desired extent. By this time, the temperature of the soap has been lowered to 150°F. and it is sufficiently plastic to be extruded and cut into three-bar lengths. After cooling to room temperature, the soap is cut to standard bar size and is then stamped and wrapped on conventional equipment (24, 25).

Somewhat different is the "Converter" which was developed by Bodman (29) for Lever Brothers. This consists of a cylindrical machine equipped with powerful screws which subjects the soap to a thorough mixing and incorporation of air. The soap is introduced at room temperature in the form of solid dry pellets with a moisture content of about 20 per cent. Sufficient heat is supplied to the soap in the mixer to render it plastic and high pressure is maintained to prevent the escape of the air after it has been forced into the soap. On extrusion, the soap has a temperature of about 185°F. It is then quickly cooled and cut into bars of the required length. Because of the vigorous working to which it is subjected, the soap has a firm smooth texture, resembling that of a milled soap. Further modifications in the process for producing aerated soap have been developed by Bodman (30).

Ittner (31), in a patent assigned to Colgate-Palmolive-Peet Co. has also described an improved process for making floating soap. This method consists of continuously mixing soap and gas in predetermined proportions and maintaining the mixture under pressure at a temperature between that at which the soap is free-flowing and that at which it solidifies. After mixing, the soap is promptly cooled to a form-retaining condition while still maintaining pressure on the product. It should be noted that the previously cited process developed by Ittner (17), for incorporating air in soap, is also suitable for use in the continuous process.

Processes for making floating soaps, other than those for mechanically aerating the soap mass, are of minor economic importance. Nonetheless, they are quite interesting and are often the result of considerable ingenuity (32). Several illustrative examples are provided in the second category which includes methods based on the *in situ* formation of gases in the soap. In a number of cases (33), this is achieved through the release of hydrogen gas as a result of the reaction between a slight excess of alkali in the soap and a small amount of a suitable powdered metal added to the soap. According to several European patents (34, 35), appropriate metals for generating hydrogen gas in the soap mass during or after saponification, include zinc, aluminum or magnesium. Silicon could also be added to hot curd soap to cause the formation of hydrogen bubbles (36).

Addition of Metal Powders

IN 1935, Blumenthal (37) provided practical details on such processes. On the basis of his own experience, he found that best results were obtained by adding only 0.03 to 0.05 per cent of magnesium powder to a cold-made soap containing 0.1 per cent excess alkali; the metal addition being made just before the soap is run into forms. When properly made, the gas bubbles are much finer than those made by crutching in air. The hydrogen in the soap acts as a reducing agent and bleaches out much of the color, thereby permitting the use of lower grade oils and fats. The presence of this gas also prevents rancidity by removing oxidation products.

In addition to the use of metallic dusts, Jungmann (38) suggested that floating soaps could be made by incorporating hydrides, nitrides, borides or carbides which react with the water of the soap to form gases. Another and much more recent approach is the process developed by Kelley

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Chelating Agent In Soaps

By John J. Singer and Frederick C. Bersworth*
Bersworth Chemical Co.

WHEN the organic chelating agent "Versene" (1), the sodium salt of ethylene diamine tetra acetic acid, was first synthesized almost 20 years ago, its peculiar chemical properties suggested that it be used as a water softener in conjunction with soap products. At that time it was not commercially feasible to use because of its cost. However, more efficient and cheaper manufacturing processes were found. About 15 years ago the compound reached a point of development where it interested detergent manufacturers as a commercially practicable adduct to soap. Since that time it has been used in and with soap preparations.

The first part of this paper deals with the use of the salts of ethylene diamine tetra acetic acid in solid soaps. Later, the application of this compound in liquid soaps, powder formulations and in cosmetics and specialty products will be discussed.

Because "Versene" is a chelating agent, that is, it inactivates harmful metallic ions in soap, one of its first uses was as an additive to stabilize soap against the effect of metallic ion impurities, thus preventing discoloration, chalking and the development of rancidity. This organic chelating agent is stable and is not decomposed in hot alkaline or acid solution. When soap is to be protected against oxidation, the chelating agent need be added in the amount of only 0.03 per cent based on the total soap content. This quantity has been found suitable for all solid soaps. In addition these soaps may be fortified with Versene so as to give hard water resistance by the addition of 2% Versene (dry weight) on the basis of the total soap content. Such a soap lathers easily and quickly in hard water. Larger amounts of the compound are not advisable because embrittlement of the soap cake results.

The chelating agent may be added to solid soap in either liquid or dry form. It is customarily added during the crutching operation.

If a soap is to contain fairly large amounts of the compound, the pH of the chelating agent should be reduced prior to addition. Neutralization can be accomplished by either a fatty acid or the chelating agent's acid. One hundred pounds of the commercial chelating agent solution should be neutralized with nine pounds of average fatty acid or four pounds of chelating agent acid. The resulting mixture will have the pH of a neutral soap. This material can then be added to a batch of soap without changing its pH.

If a fatty acid is used to neutralize the chelating agent, heat should be applied and the mixture stirred. Two layers will be formed. The top consists of salted-out soap. The bottom layer is chelating agent at pH 10. All of this material should be added to the soap. If it is thought that too much water is introduced by this procedure, the mixture can be evaporated until a paste forms. This thick, pasty, "master soap" is an excellent method of introducing the chelating agent into the crutching operation.

We do not believe nor recommend that the acid alone should be added to the soap to reduce its pH or to give hard water resistance. The conditions which are found in a thick pasty mass are not suited to the neutralization and dispersion of an insoluble acid. Local concentrations of aggregates are sure to form since chemical action under these conditions is slow. Soap thus treated has a decided tendency to become spotty and form crystalline growths.

Versene in Liquid Soaps

THE factors involved in the use of a chelating agent in liquid soaps for clarification are few and simple. For obvious reasons, however, it is not possible to state with any degree of accuracy the exact amount of chelating agent which is necessary to clarify a given liquid soap. The uncertainty arises because of the variable nature of water in different parts of the United States.

Even those manufacturers who use ion exchange columns are not always completely free from the hard water problem. Since these columns are not 100 per cent efficient, on occasion enough calcium and magnesium is left in the water to cause trouble. Generally speaking, if the hardness of the water is known, the amount of chelating agent necessary to clarify a soap depends upon the amount of calcium and magnesium in the water. That is, for every 30 grains of hardness introduced into a soap by hard water, one fluid ounce of Versene is necessary to soften the water and thus prevent the deposition of insoluble soaps.

Any soap which is made by adding Versene in the above ratio

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* A paper delivered by Dr. Singer before the mid-year meeting of the Chemical Specialties Manufacturers Assn., Washington, D. C., December 5, 1949.

† "Versene" is the trade name for a compound whose chemical name is Ethylene Diamine Tetra Acetic Acid, Tetra Sodium Salt. The methods of synthesis of this compound were developed by Frederick C. Bersworth and by the I. G. Farben Industries. Bersworth Chemical Co., Framingham, Mass., and General Dyestuff Corp., New York, manufacturers and distributors of this material, operate independently and under separate patent structures.

will have about the same properties as a soap prepared with distilled water. Frequently, however, calcium or other metal ions which precipitate soap are introduced into the raw materials. The quantity of impurity is variable and no calculation can be used to determine the amount of chelating agent necessary to overcome the effects of these impurities. For this reason a simple test must be made. It consists of taking a sample of turbid soap and adding chelating agent drop by drop until the soap becomes clear. The chelating agent should be diluted to prevent the temporary salting out of the soap. The soap solution should be shaken after each addition of chelating agent. Since the amount of soap taken for a sample and the amount of sequestering agent added are known, it is easy to calculate how much chelating agent is necessary to clarify the soap.

If control is adequate and if soap runs can be duplicated with precision, only a few tests are needed to establish a working procedure. Some manufacturers add chelating agent to the potassium hydroxide solution or amine which is used to saponify oils or fatty acids. This method is satisfactory and has been used in New England for some time. Its advantage is that large amounts of chelating agent may be added to the soap without increasing the pH. Other manufacturers introduce the sequestering agent after filtration. Even though such a compound has been used, filtration is necessary to remove any dirt, unsaponifiable material, or other insoluble matter which has been introduced into the soap from the raw material or the surrounding atmosphere. Soap makers have found that if adequate amounts of chelating agent are used, it is not necessary to chill the soap before filtration. Other soapers, who are reticent about completely eliminating the chilling process do not chill their soap to as low a temperature as was customary before chelating agent was used.

Another important use of the chelating agent is its addition to concentrated liquid soaps which, after shipment, are to be diluted with tap water prior to their actual use. The amount of chelating agent to be added prior to shipment should be sufficient to soften completely the hardness of the water with which the soap is to be diluted. For instance, if 50 gallons of 40 per cent liquid soap are to be sent to an area where the water hardness is 180 p.p.m., and the soap is to be diluted with water to give a 20 per cent product, the 40 per cent soap solution should contain 17 fluid ounces of Versene for each 50 gallons. This practice allows the purchaser to dilute the soap with ordinary tap water rather than using distilled water.

Since 180 p.p.m. hardness is about average in the United States, the quantity of chelating agent suggested is best suited for most conditions. If the diluent water is known to be of greater hardness, then more chelating agent should be used at the rate of one fluid ounce per 30 grains hardness (calculated as calcium carbonate. Should the soap be diluted with water which is less than 180 p.p.m. hardness, the excess chelating agent will give the liquid soap hard water resistance. That is, the soap at least partially will soften the consumer's water, thus giving soft water performance in hard water areas.

Methods of Analysis

IF ANY compound is to be added or used in the manufacture of soap, it is of the utmost importance that methods of analysis be developed so that adequate control can be exercised. A quick, simple and accurate method of analyzing chelating agent in soap was developed by our company with the C. B. Dolge Co., Westport, Conn. The test has an accuracy of .01 per cent. Its principal limitation is that it is an analysis for *active* chelating agent. That is, excess compound over and above the amount necessary to chelate or sequester any metallic ions.

Actually this is not a severe limitation since a slight excess of chelating agent should be present so as to insure permanent clarification. As long as any chelating agent is found to be present by this test all metallic ions have been chelated and the soap is protected from clouding which almost invariably is caused by insoluble metallic soaps.

The analysis, however, can be manipulated in such a way that it is possible to determine with accuracy the exact amount of chelating agent necessary to clarify a soap. If a known quantity of chelating agent is added to a weighed quantity of cloudy soap, which is titrated by the following method, the difference between the amount of chelating agent added and the amount found is the exact quantity of sequestering agent necessary for clarification.

This method of analysis discounts any inaccuracies that might be attributed to the greater solubility of calcium soaps in concentrated soap solution.

The general analytical procedure is as follows: A dot ⅛ inch in diameter is made with a red glass marking pencil on the outside surface of the bottom of a 250 ml erlenmeyer flask. 100 grams of liquid soap are placed in the flask. The soap solution is titrated as rapidly as possible with .1 molar calcium chloride solution until the dot disappears from sight. During the titration the flask should be illuminated evenly and the dot should be viewed from a point just below the surface of the soap solution. The angle of view is important because it controls the path of sight through the opalescent soap solution. A blank is run on the same amount of soap containing no sequestering agent. This blank value is subtracted from the initial titration, the difference being the amount of calcium absorbed by the *active* chelating agent present in the soap. One cubic centimeter of .01 molar calcium chloride is equivalent to .05 of a gram or .05 per cent of dry Versene, if 100 grams of soap are used. A sample run may be illustrated as follows:

A 100 gram sample of liquid soap containing chelating agent is titrated with 4.2 cc. of .1 molar calcium chloride (a blank made with the same soap containing no sequestering agent requires .5 cc. of the calcium

chloride to obscure the dot). 4.2-.5 or 3.7 cc. of calcium chloride was absorbed by the chelating agent present. This means that 3.7 x .05 or 0.185% active Versene is present. The end point of this titration is fairly accurate. One drop of calcium chloride solution is usually all that is necessary to complete the end point. The blank value will vary somewhat with the kind of concentration of the soap used. By preparing liquid solutions of solid soaps, this method may also be used to evaluate the active sequestering agent content of sodium soaps. If at any time there is 0.03 of one per cent chelating agent on a dry basis in soap, it is protected against oxidation and rancidity even though the sequestering agent has been combined with calcium and consequently no longer analyzes as *active* material.

The word active has been used in the sense that it denotes potential chelating ability. If organic chelating agents have been used previously as additives to soap to give hard water resistance properties, then this method is of particular interest in control work. If chelating agents are not used at present, but are under consideration, this method should be an aid in evaluation.

Use in Wash Machines

ANOTHER use for chelating agents is in soap mixtures designed for use in automatic dish washing and laundry machines. The physical and chemical properties of organic chelating agents are such that the material may be added to existing formulations without changes in manufacturing techniques.

Besides the property of softening water without producing scale and scum forming materials, sequestering agents aid in the cleaning process by solubilizing and hydrolyzing proteins, and by saponifying fats and oils. The amount of compound needed to achieve these results depends on the volume and hardness of the water used. The amount of compound recommended per loading should contain enough chelating agent to soften the water in the washer. For a washer containing five gallons of water whose hardness is 171 p.p.m. or 10 grains; ½ an ounce of dry Versene is necessary to soften the water to 0 hardness. If ½ ounce of this chelating agent is present, only .21 ounces* of pure soap is necessary to produce a permanent lather at 150°F. This solution is perfectly clear and transparent and there is no cloudiness. If no sequestering agent is used, almost seven times as much soap is necessary to produce the same lather. Besides, the solution is milky in color due to the calcium soap which later will deposit on the machine and any articles being washed. A typical washing compound might contain ½ ounce of chelating agent in powder form to every 1/5 ounce of pure soap and as much builder as desired. The recommended composition of this powder is ½ ounce of chelating agent and 1/5 ounce of soap. Such a mixture leaves dishes sparkling clean and clothes free from soap scum and unsightly deposits.

Special detergent compounds for specific industries can be easily formulated with organic chelating agents. For instance, in the woolen industry, it is quite a problem to clean wool and other materials which are thoroughly impregnated with calcium salts. Soap alone is not efficient under these conditions and for this reason many of the wool scouring companies have switched to synthetic detergents in recent years. A soap which is amply fortified with an organic chelating agent is very effective in cleaning such calcium impregnated wools. Soaps intended for this use should contain about five per cent chelating agent on a dry basis. Commercial soaps can be formulated in a similar manner for improved performance under adverse conditions.

In the detergent industry the use of organic chelating agents is not limited to soap alone. The performance of synthetic detergents is also enhanced by this material. Quite frequently solutions of synthetic detergents develop flocs when allowed to stand for some time. While this does not materially decrease their performance, it does detract from their appearance when sold for household use. This floc in many cases is insoluble metallic compounds which can be solubilized with a sequestering agent.

Not much emphasis has been placed on the fact that the efficiency of many synthetic detergents is decreased in hard water. This reduction in cleaning power is not obvious to the average user since the detergent solution does not become cloudy as would a soap solution under the same conditions. If a chelating agent is used with synthetic detergents, soft water performance is maintained in hard water and a detergent solution has better storage characteristics.

Chelating Agents in Cosmetics

COSMETIC ointments, deodorants and cold creams, particularly those containing a high percentage of lanolin, are formulated into a smoother and richer cream by the addition of small amounts of sequestering agent (again on the order of .03 per cent dry basis). Preparations containing chelating agents are protected against oxidation, rancidity, discoloration and to some extent caking.

Hair tonics, lotions and other similar compounds can be protected against darkening by the addition of a chelating agent. An alcohol-castor oil mixture which contains only a very small amount of water can be protected against color change upon exposure to ultra violet or sun light by the addition of a very small fraction of a per cent of chelating agent.

One of the large potential markets of the cosmetic industry is for an efficient hair rinse. Most of the hair rinses now available utilize either a polyphosphate or a citrate as a water softener and solvent for calcium soaps. The citrates are inefficient and the polyphosphates are unstable, leading to short shelf life. Both tend to precipitate fatty acids on the hair. A considerable amount of work has been done with the salts of ethylene diamine tetra acetic acid as hair rinses. Since this chemical compound is stable in alkaline solutions, its pH can be adjusted to that of a neutral soap. At this pH

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* From "Soap Consumption in Hard Water" by Don Raymore, *Soap and Sanitary Chemicals*, P. 48, October, 1946.

Detergent Developments...

Part II

By Reynold C. Merrill
Philadelphia Quartz Company

SODIUM or potassium soaps are excellent detergents, wetting and emulsifying agents and are usually available at a relatively modest price. However, they have the three disadvantages of being precipitated by the low concentrations of calcium and magnesium salts found in ordinary hard waters, of being only slightly soluble in cold water, and of being effective only in slightly alkaline solutions with a pH approximately equal to or greater than about 10. This pH corresponds to the neutral hydrolysis alkalinity of a pure neutral soap. When washing in water with a hardness equivalent to 15 or 20 grains of calcium carbonate per gallon, about half the soap needed is used to precipitate the hardness. Modern synthetic detergents of various types, — cationic, anionic and nonionic — were developed to meet the need for cleansing compounds effective under conditions such that soap gives poor results or cannot be used.

Sulfated oils, the second type of surface active agent developed, are made by treating glyceride fats and oils, particularly castor oil, with concentrated sulfuric acid. The products obtained are known as turkey red oils, and are usually but erroneously referred to as "sulfonated" oils. Actually these products are mainly sulfates for the predominant reaction occurring in their preparation is sulfation of the hydroxyl group of ricinoleic acid. Sulfated oils are widely used by the textile industry for softening, sizing and finishing and as a wetting out agent when dyeing in neutral or acid solution. Unlike soap they are stable in acid solution and ordinary hard water. The precipitate formed in very hard water is less flocculent and has less tendency to adhere to fabric than that formed with soap.

During the late 1920's H. Bertsch and others pointed out that the carboxyl group of soaps must be eliminated or blocked by another type of group in order to obtain a product not readily precipated in hard water. About 1931 the I. G. Farbenindustrie introduced the synthetic detergent made from oleic and isethionic acids which had the formula $CH_3(CH_2)_7CH = CH(CH_2)_7 - COOCH_2CH_2SO_3Na$. This sulfonated ester was an excellent detergent even in hard water and dilute acids, but the ester linkage hydrolyzed readily in alkaline solution to give soap. Shortly thereafter, *Igepon T*, which is similar to *Igepon A* in detergent action but more resistant to hydrolysis, was introduced. This sulfonated amide is made by condensing oleyl chloride with methyl taurine and has the formula $CH_3(CH_2)_7-CH = CH(CH_2)_7 - CON(CH_3) - CH_2 - CH_2SO_3Na$.

Both products, as well as similar ones containing other fatty acids, were soon introduced into United States by the General Aniline Co. and are now sold by General Dyestuff Corp. Sulfated amide detergents are now available from several companies. One process involves the condensation of fatty acids with monoethanolamine or other amino alcohol, followed by sulfation, and neutralization. In another, stearamide produced from stearic acid and ammonia is treated with ethylene oxide and the resulting amide alcohol sulfated. Treatment of a fatty acid with ethylene oxide gives an ester alcohol which can also be sulfated.

Sulfated monoglycerides of the general formula $RCOOCH_2 CHOH CH_2OSO_2Na$, where R stands for a fatty acid group, are produced by the Colgate-Palmolive-Peet Co. from oils such as coconut oil, glycerin, sulfuric acid and sodium hydroxide or other alkali and are active ingredients in products sold under the trade names, *Artic Syntex M, Vel*, and *Halo*. They are good detergents.

The American Cyanamid Company's *Aerosols* are almost all excellent wetting agents, but poor detergents, produced by esterifying maleic acid or anhydride (obtained in the catalytic air oxidation of benzene) with a short chain alcohol and treating the product with sodium bisulfite. *Aerosol OT* is the sodium salt of the di (2-ethyl hexyl) ester of sulfosuccinic acid; related products vary in the chain length of the alcohol. Sodium salts of sulfoacetates are also commercially available detergents.

Sulfated Alcohols

THE sodium salts of fatty alcohol sulfates are made commercially by treating long chain alcohols with concentrated sulfuric or chlorosulfonic acid followed by neutralization with sodium hydroxide. Those made from primary alcohols are excellent detergents, readily soluble in cold water to give neutral solutions, are not precipitated in hard waters and are stable

in dilute acids and alkalies. In fact the calcium and magnesium salts of the long chain sulfates are more soluble than the corresponding sodium and potassium salts. All are excellent detergents.

Long chain primary alcohols were originally obtained from spermaceti but most of the commercial products were made by reduction of glyceride fats and oils in the presence of a suitable catalyst such as copper chromite at temperatures around 250° to 300° C. and pressures up to 220 atmospheres. Under suitable conditions oleic acid or triolein can be reduced to oleyl alcohol with very little hydrogenation of the double bond. At the present time a substantial proportion of the long chain alcohols are produced commercially by reduction of the gylcerides or acids with sodium metal (Bouveault Blanc reduction). Procter & Gamble's *Orvus WA* and *Dreft*, and Du Pont's various *Duponols* are long chain sodium alkyl sulfates.

Salts of fatty alcohol sulfates from long chain secondary alcohols obtained by the catalytic hydration of olefins, hydrolysis of chlorinated hydrocarbons or by the Fischer-Tropsch process are good wetting agents but relatively poor detergents. Carbide and Carbon Chemicals Division's *Tergitols* include products of this type; *Tergitol* 4 is the sodium salt of the sulfation product of 7-ethyl-2methyl-undecanol-4.

Alkyl Aryl Sulfonates

THE majority of detergents other than soap now being produced are alkyl aryl sulfonates. Treatment of alkyl benzenes having side chains of 10 to 18 carbon atoms with concentrated sulfuric acid followed by neutralization with an alkali, usually so-sodium hydroxide, produces a good detergent. If propyl or butyl naphthalenes or anthracenes are treated similarly, the product is a good wetting agent but a poor detergent.

Alkyl benzenes are produced by chlorinating the kerosene fraction of petroleum and reacting the monochlorinated product with benzene in the presence of aluminum chloride as a catalyst (Friedel Crafts reaction). They are purified by distillation. Most

The development of synthetic detergents and their advantages, as compared with soap, are told in the second part of this series. Types of synthetics and commercial examples given.

commercial alkyl aryl sulfonates contain the sodium sulfate formed by neutralization of the excess sulfuric acid. The inorganic salts can be removed by extraction to give a product completely soluble in non-aqueous solvents, but this is expensive and moderate amounts of inorganic salt contribute to the physical appearance and surface activity. Somewhat impure mixtures are often actually better detergents than the purified material.

Alkyl aryl sulfonate detergents, such as dodecyl benzene sodium sulfonate, are mixtures of isomers containing straight and branched hydrocarbon chains with the sulfonate group attached to the ring mostly in the para position. They are highly soluble in cold water, are not precipitated in water containing up to 300 parts per million calcium carbonate equivalent hardness, and are resistant to oxidizing and bleaching agents and to 10 per cent acid or 15 per cent alkali. This type of detergent is available at low cost from abundant inexpensive petroleum derivatives.

Leading commercial products in this class include National Aniline's *Nacconols*, Monsanto's *Santomerses*, Oronite's *Oronites*, Atlantic Refining's *Ultrawets*, and Wyandotte's *Kreelons*. (The Oronite Chemical Co. is a subsidiary of Standard Oil of California). Other oil and chemical companies are either now producing smaller amounts than the above or are actively investigating the field.

Aliphatic Sulfonates

IN 1936, C. F. Reed was granted a patent describing the production of aliphatic sulfonyl chlorides from the reaction of hydrocarbons with chlorine and 50-300 per cent excess sulfur dioxide in the presence of actinic light or ultraviolet light from an ordinary tungsten or mercury vapor lamp. When long chain sulfonyl chlorides are hydrolyzed by hot sodium hydroxide or sodium carbonate, an aliphatic sodium sulfonate is obtained which is a good wetting agent and fair detergent. Sulfonylation occurs at random along the hydrocarbon chain so that the resulting product is a mixture. The aliphatic sulfonates are readily soluble in cold, hard water and were used in the Army and Navy's all purpose soap during World War II.

This process was used extensively in Germany by the I. G. Farbenindustrie who prepared sulfonyl chlorides from the hydrogenated fraction of the Fischer Tropsch process boiling from 220° to 320° C. and containing an average chain length of 15 to 16 carbon atoms (*Mepasin*). These sulfonyl chlorides were then sold to soap companies who saponified them to produce detergents containing 5 to 7 per cent sulfonates (*Mersolates*). Detergents are also produced by treating the sulfonyl chloride with ammonia to form the amide which then reacts with either formaldehyde and sodium bisulfite or ethylene oxide. DuPont produces several long chain sodium sulfonates presumably by this process; their MP 191 is a fairly pure heptadecane sulfonate with about 50 per cent sodium chloride and some sodium sulfate.

The Solvay Division of the Allied Chemical & Dye Corp. produces their detergent, *Nytron*, by the addition of nitrosyl chloride to a long chain olefin fraction from petroleum to give a nitroso chloride which reacts further with sodium bisulfite to give a free flowing light brown powder. The nitrosyl chloride is a byproduct from the new commercial production of chlorine from nitrogen dioxide and

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WHAT'S NEW?

New counter display for five new household aerosol products of Casco Products, Inc., Bridgeport, Conn. The new cardboard display is lithographed in four colors. It is 20 inches wide, 12 inches deep and 18 inches high. Behind each aerosol on the display is a lithographed replica, with price tag, so that when the aerosol product is removed the facsimile remains. Display is by Norman D. Waters Associates, New York, and Einson-Freeman Company, Long Island City, N. Y.

New retail line of aerosol products being introduced nationally by La Salle Chemical Co., Chicago, to retail for 98 cents. Similar two color labels carry out family product idea, with colors differing for each of the four items. Dispensers are 12 oz. size.

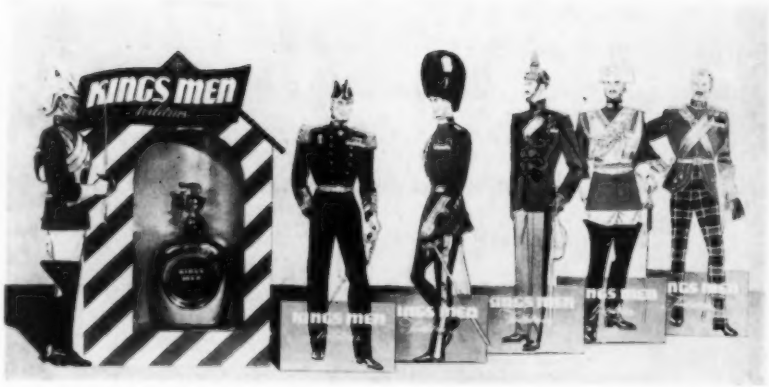
Lower left: New packaging for "Magic Washing Solution," made by Magic Manufacturing Co., Charlestown, W. Va., is glass quart, half-gallon and gallon glass jugs, all by Owens-Illinois Glass Co., Toledo. The company recently completed a large plant expansion program, more than doubling production facilities.

National distribution on its self-polishing floor wax is now underway with extensive newspaper and radio advertising, it was announced recently by Gold Seal Co., Bismarck, N. D. Promotion on the carnauba type wax will follow the style used successfully for the firm's "Glass Wax." The wax has been sold in a limited area previously for 7 years.

Two color ACL labels which will not smear or rub off used with stock Boston Round bottles result in attractive packages for "Texize Household Cleaner" made by Texize Chemicals, Inc., Greenville, S. C. Lithographed metal screw caps complete packages, which are made by Owens-Illinois Glass Co.

New "Fresh" deodorant bath soap made by Pharma-Craft Corp., New York, contains BIS (3,5,6 — trichloro-2 hydroxyphenyl) methane as its germicidal ingredient. A 4.5 ounce cake of "Fresh" retails for 25 cents.

A collection of lithographed cardboard "Kings Men" in full dress uniforms are elements in the new display for "Kings Men Toiletries of 42" Products, Ltd., Los Angeles. Displays are manufactured and lithographed by Einson-Freeman Co., Long Island City, N. Y.



New "Air-Gly" air sanitizer that contains triethylene glycol was announced last month by Hysan Products Co., Chicago. The bomb is also recommended as an air freshener and room deodorant. The spray contains perfume; is also available without it.

A 10-cake assortment of toilet soap packed in a re-usable plastic bag to retail for 59 cents was announced recently by Allen B. Wrisley Co., Chicago. Soap scents in the new plastic package include: apple blossom, gardenia, lilac, lanolated cold cream, pine and pure baby Castile. The soap is Wrisley's regular toilet quality, hard milled in hand size ovals, rounds and squares. Other assortments, too.

TRADE NEWS

Yardley Advances Stewart

David J. Stewart, Jr., previously assistant sales manager and associated with the firm for 21 years,

DAVID J. STEWART, JR.

was recently appointed field sales manager in the United States for Yardley of London, Inc., New York. John Bales continues as general sales manager.

Named as advertising manager is Fred J. Pullen, Jr., who was formerly advertising and sales promotion manager for British Overseas Air Ways in the U. S., Canada and the West Indies. He succeeds Bennet Byron, for the past four years advertising manager, who has been named vice-president of William Esty Co., New York, advertising agency.

Shulton Expands

Expansion of its production and distribution facilities in Chicago and Havana, Cuba, was announced recently by Shulton, Inc., New York. A new Chicago building at Touhy and Cicero Aves. is now under construction and will provide offices and warehousing space in its 125 x 150 foot structure. Space has been leased in a building in Havana, where some manufacturing activity will also be carried on. Adrian Rubio, who has been with Shulton for the past 18 months, is in charge of all operations in Havana. The company also has manufacturing facilities in Canada and Mexico.

Lever, Coast Soaper, Dies

Clarence Lever, 49, a soap manufacturer of Pasadena, Calif., who at one time was involved in litigation with Lever Brothers Co., New York over the similarity in names between the two companies, which are in no way affiliated, died Feb. 6, of a cerebral hemorrhage.

Appeal F.T.C. Ipana Order

An appeal in the U. S. Circuit Court of Appeals of Richmond, Va., from an order of the Federal Trade Commission requiring Bristol-Myers Co., New York, to discontinue alleged misrepresentation of its "Ipana" tooth paste, was announced recently by the firm. Earlier the F. T. C. ordered the firm to stop "misrepresenting the therapeutic value of 'Ipana' tooth paste and the extent to which it is used or recommended by dentists." The Commission also hit the "prevention of pink tooth brush" claim made for the product.

Breck Dispenser Offer

John H. Breck, Inc., Springfield, Mass., recently announced that it is offering a four-ounce dispenser bottle with purchases of any eight-ounce size of "Breck" shampoo. The combination retails for $1.25. The plastic dispenser is refillable.

Kilcran Joins Stanley

J. W. Kilcran, formerly merchandising executive for Colgate-Palmolive-Peet Co., Jersey City, N. J., recently was appointed sales manager of John T. Stanley Co., New York. The post is a new one, the duties having formerly been handled by N. S. Dahl, general manager of the firm, who continues in that capacity. Mr. Kilcran had been with Colgate for about 25 years.

Atlantic Transfers Herman

The transfer of R. J. Herman to the Chicago office of Atlantic Refining Co. was announced recently by

R. J. HERMAN

the chemical products section of Atlantic. Mr. Herman will handle the "Ultrawets," the firm's alkyl aryl sulfonate type synthetic detergents and other Atlantic petroleum chemicals in the midwestern states.

Coconut Oil Exemption Query

The reason why imports of coconut oil were specifically exempted from the order of the Secretary of Agriculture prohibiting U. S. imports of certain fats and oils was asked recently by the National Renderers Assn. and two meat packer trade associations. The request for the information was contained in a letter to the senate agriculture committee. In the letter it was pointed out that since coconut oil is used principally in soap and that it competes with and displaces the inedible animal fats produced by members of the associations, some explanation for its exemption should be made.

The letter also expressed the belief that two bills introduced at the last session of Congress, providing equalization fees on fats and oils imports are an important part of the answer to the fats and oils price sup-

Honors Los Angeles Soap Co. on Brands

J. Paul McKinney (left), sales manager of the Los Angeles Soap Company of Los Angeles, receives a Brand Names Foundation "Golden Anniversary Certificate of Public Service" from Henry E. Abt, president of the Foundation. The certificate, presented at a dinner in the Biltmore Bowl climaxing Los Angeles' Brand Names Day, was awarded to the brand name "Los Angeles Soap" which has identified soap continuously since 1897. Donald B. Douglas, Vice President of The Quaker Oats Company and Chairman of the Board of Brand Names Foundation, delivered the address of the evening, admonishing those present to "answer attacks on the American business system now, before it is too late."

port dilemma. It was also pointed out in the letter that the principle can be applied to other agricultural commodities on which there are price supports.

Feldmans Return Home

Henry Feldman, general manager of the Mt. Hope Soap Co., Portland, Oregon, accompanied by Mrs. Feldman, returned late in February from a month trip to New York, including a Caribbean cruise aboard the S/S "Italia" of the Italian Line and attendance at the AASGP soap industry meeting in January. The Feldman's eastern trip was partly in the form of a wedding anniversary celebration, they having been married in New York thirty-two years ago. Mr. Feldman noted that next year Mt. Hood Soap would complete fifty years in soap manufacture, having been founded in 1901. Company plans for plant expansion in keeping with growing sales are expected to be announced later this year.

Bon Ami Earnings Down

Bon Ami Co., New York, recently reported a decline in its net income and earnings for the past year, as compared with 1948. In 1949 the net profit, after a $78,557 loss on devaluation of foreign currencies, was $343,927, equal to $3.64 per class A share, as against $739,660, or $4.00 per class A share. The company's report showed that the decrease in earnings from regular operations was partially due to the lower sales volume on "Bon Ami Cleanser" and Cake, but more so as a result of heavy introductory and promotional expense on "Glass Gloss."

C-P-P, Ltd., Names Shore

The appointment of A. "Brock" Shore as industrial district manager for the Province of Ontario, Canada, was announced recently by Colgate-Palmolive-Peet Co., Ltd., Toronto. He is making his headquarters at the company's head offices in Toronto. Mr. Shore joined the company in 1926, starting in the production department. In 1935 he was appointed industrial representative for Western Ontario, and a few years later was transferred to Toronto.

Shemen Soap Wks. Sold

Hamashbir Hamerkazi recently acquired the sole ownership of Shemen Works, Haifa, Israel soap and olive oil firm. The Industrial Investment Co., which represents private capitalists headed by the Taiber Brothers and hitherto owned a half interest in the factory, has sold its shares to the Histadrut institution (labor union). The Shemen works, which today employs about 500 workers, is one of the oldest factories in Israel. Established 26 years ago, it developed out of the Atid Co., which was founded in 1904.

New Detergent Compound

A novel formulation of synthetic detergents, specially blended for high synergistic effect, has been developed by Demo Laboratories, Bogota, N. J., it was announced recently. The new compound, bearing the trade name "Demoncon W-100," is 100 per cent active in composition. It is non-ionic in character. Recommended as a base concentrate, it can be diluted with from two to 100 parts of cold water, according to specific formulas provided by the manufacturer to yield products for dishwashing, car wash, rug and upholstery shampooing, wall and woodwork cleaning, window cleaning, etc.

McElroy on GE Board

Neil H. McElroy, president of Procter & Gamble Co., Cincinnati, and president of the Association of American Soap & Glycerine Producers, Inc., was recently elected to the board of directors of General Electric Co., Schenectady, N. Y.

Mem Imports Austrian Soap

Soaps from Austria, the first to be imported since before the war, are now available on the American market, it was announced recently by Mem Co., New York. A sufficient stock has been built up at plants in Vienna to assure a steady supply for the American market, the company states. The familiar soaps decorated with paintings of fairy tale scenes are among those being imported.

L. S. Kohnstamm Dies

Lothair S. Kohnstamm, 69, president of H. Kohnstamm & Co., New York, died Jan. 29 at his home, 1185 Park Ave., New York, of a heart ailment. He joined the firm 48 years ago and became president in 1932. He is survived by two sons, Paul and Richard, and a daughter, Mrs. Leslie Ogden.

Soap Sales Decline in 1949

SOAP sales in terms of dollars and volume declined in 1949, as compared with the previous year, according to the census report issued recently by the Association of American Soap & Glycerine Producers. Totals for the fourth quarter of 1949 were also lower than in the preceding quarter, and fell below the comparable figures for the final quarter of 1948.

Although volume in terms of pounds was down approximately five percent in 1949, as compared with the previous year, the dollar total was down about 30 percent last year from the 1948 level. In 1949, 2,440,815,000 pounds of other than liquid soap, worth $453,576,000, were reported sold, as against 2,491,280,000 pounds, valued at $578,578,074 in 1948. The 1947 totals were given as 2,814,847,000 pounds, with a value of $640,586,000. The 1949 total sales figure in terms of dollars, reflecting lowered soap prices, went below the $500,000,000 mark for the first time since 1946, when short supplies of raw materials curtailed production.

Liquid soap sales in terms of gallons and dollar worth rose sharply in 1949, going from 3,301,148 gallons worth $4,138,044 in 1948 to 6,039,000 gallons, valued at $7,528,000, last year. The number of reporting firms increased significantly, which may account partially for the large difference in the figures for 1948 and '49. Fourth quarter liquid soap totals in 1949 were down, compared with the previous quarter, but were above the fourth quarter figures of a year ago.

Synthetic detergent sales amounted to 712,456,000 pounds, worth $145,160,000, based on figures recived from 37 manufacturers during 1949. In 1948, 17 manufacturers reported synthetic detergent sales of 401,863,000 pounds, valued at $111,-134,000. Synthetic detergent sales dropped from 205,757,000 pounds, worth $40,770,000 in the third quarter to 181,323,000 pounds, with a value of $34,949,000 in the final three months of '49.

Liquid soap sales in the fourth quarter, 1949, were 1,568,000 gallons, having a value of $1,811,000, as compared with 1,697,000 and $2,455,000 for the previous quarter. In the final quarter of 1948, liquid soap sales were put at 918,148 gallons, worth $64,044.

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Socony Organ on Soap

Soap, its history and some uses, are discussed and illustrated in the January, 1950 issue of *Oil-Power*, house magazine of Socony-Vacuum Oil Co., 26 Broadway, New York 4. In addition to a cover photograph of soap ribbons coming off a chilling roll, there are illustrations of a soap kettle, a soap kettle room and other pictures of soap production and packaging operations. A flow chart of soap making by the boiled process is shown and illustrations of various types of soaps and their uses included in the publication. Soap's uses in industry and per capita consumption of soap in 23 countries are also listed. A brief description of synthetic detergents and their applications is also covered.

◆

O. Dexter Neal Dies

O. Dexter Neal who conducted his own color business in New York, died of a heart attack on February 19th at his home in Rockville Centre, Long Island. He had been seriously ill since December. For a number of years he was a special sales representative for the Hilton-Davis Chemical Co., Cincinnati, and at one time was technical director of Primrose House, New York cosmetic firm. Mr. Neal was a leading expert in cosmetic colors, specializing in lip-stick, rouge and nail polish tints. He was born in 1891 in Lafayette, Ind. and was a graduate of the University of Indiana. His career as a color chemist included a number of years with Hilton-Davis at their Cincinnati laboratories. He is survived by his wife, a daughter and one grandchild. Funeral services were held at Rockville Centre on Feb. 22 and burial was in Indiana.

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Terry in Antara Post

The appointment of Dr. Daniel H. Terry as manager of technical service of Antara Products, a division of General Aniline & Film Corp., New York, was announced recently. He was a process development chemist previously in the company's Grasselli, N. J., plant since 1945. Earlier he had been with E. I. du Pont de Nemours & Co.

Group photograph below of the Bims of New York, was taken at their annual dinner at the New York Athletic Club.

Dahl Aids Red Cross

Nils S. Dahl, general manager of John T. Stanley Co., New York, recently accepted the chairmanship of

NILS S. DAHL

the soaps division of the 1950 Red Cross Fund campaign of Greater New York.

E. V. Soverel Dies

Elmer Vernol Soverel, 73, formerly with Colgate-Palmolive-Peet Co., Jersey City, N. J., died at the home of his daughter in East Orange, N. J., Feb. 5. A veteran of the Spanish-American War, and a member of a colonial family, he is survived by a daughter, a son and three grandchildren.

Egypt's Soap Industry

According to a recent issue of Egypt *News*, that country now has 213 soap plants, which employ more than 4,000 workers. The capital investment in the Egyptian soap industry amounts to $10,000,000.

Boston Bims Bowl

The BIMS of Boston held their first mid-winter bowling party and dinner of the season at the Weston Golf Club, Weston, Mass., on Tuesday evening, February 28. About fifty members and guests attended. W. E. Johnson, of U. S. Industrial Chemicals, Inc., chairman, presided. Preceding dinner there was bowling from 6 to 7:30, and again after dinner from 10 to 11 P. M. There were the usual bridge and gin-rummy games. The club bar was open throughout the evening, which reports indicate may have accounted for the better bowling scores rolled during the pre-dinner session.

Guerlain Reimports Soaps

In connection with the announcement of the renewed importation of its "Fleur des Alpes" and "Jasmin" soaps, Guerlain, Inc., New York, recently announced reductions in the price of these two soaps and the "Iris" and "Geranium" soaps as well. Guerlain soaps, manufactured in England since the bombing out of the French factory, come packaged in boxes of three. Each cake is individually wrapped in traditionally French paper. Prices are now listed as follows: "Fleurs des Alpes," $1.50; "Geranium," $2.25; "Jasmin," $3.00, and "Iris," $3.00.

P&G Prods. Names Two

Procter & Gamble Productions, Inc., Cincinnati, recently named Gail Smith as manager of television and nighttime radio production. The company also appointed William F. Craig as associate manager. Gilbert A. Ralston continues as executive producer of television, with headquarters in Hollywood.

MacKenzie Labs. Bankrupt

A meeting of creditors of MacKenzie Laboratories, Inc., Chester, Pa., was held at the U. S. Court House, Philadelphia, Feb. 21, at which time creditors attended, proved their claims, appointed a trustee and a creditors' committee. The firm was adjudged bankrupt on a petition filed against it on Jan. 11, 1950. All claims must be filed with the Referee, David Backman, before May 21, 1950.

Purex Earnings Off

Purex Corp., Ltd., South Gate, Calif., had a net income for the year to Oct. 31, last of $403,573, equal to $1.01 a share, as compared with $571,502, or $1.43 a share for the previous fiscal year. During the first seven months of the last fiscal year the company had a net income of only $20,353, according to the recently issued report.

Solvay Promotes Merritt

Harold F. Merritt has been appointed executive vice president with responsibility for the direction of all

H. F. MERRITT

activities of the Solvay Sales Division, Allied Chemical & Dye Corp., New York, it was announced Feb. 27. Mr. Merritt has been associated with the Solvay sales organization and its predecessor, Wing & Evans, Inc., since 1913. He has been a vice president of the company for the past 19 years.

Emanuel Selling for Berje

Berje Products Co., New York, recently announced that Allan Emanuel has joined the company as a sales representative in the metropolitan area. He is a graduate of New York University and has had wide experience in selling. He is also acquainted with the chemical line.

D-12 Meets Mar. 21-22

The annual meeting of Committee D-12 of the American Society for Testing Materials will be held Mar. 21-22 at the Park Sheraton Hotel, New York. Several proposed new standards covering the testing and quality of various materials in the committee's scope will be considered and other activities will be discussed. J. C. Harris, Monsanto Chemical Co., Dayton, O., is secretary; F. W. Smither, chemist (retired), National Bureau of Standards, Washington, D. C., is chairman of the committee, and Frederick Krassner, Department of the Navy, Brooklyn, is vice-chairman.

Canada '48 Soap Figures

Value of products, number of employees and wages of the soaps, washing compounds and cleaning preparations industry increased during 1948, as compared with 1947, according to the report on the industry just issued by the Dominion Bureau of Statistics, Montreal. In 1948, 149 factories in Canada made soap and related items as their main products, which had a value of $67,586,991 or 27 percent more than the output of $53,200,468 from the 166 firms in the industry in 1947. There were 3,351 employees in the soaps and related products industry in 1948 as compared with 3,262 in 1947; salaries and wages amounted to $8,124,916, against $6,804,806, respectively for the two years.

The output of the industry included 19,477 tons of toilet soaps, valued at $5,334,899; 20,571 tons of soap chips and flakes at $7,537,402; 51,040 tons of soap powders at $15,481,284; 1,802 tons of textile and milled soaps at $536,218; 634 tons of castile soap at $235,828; 619 tons of shaving soaps and creams at $1,407,054; 5,256 tons of liquid soaps at $1,242,299; 2,005 tons of soft soaps at $429,847; cleaning and scouring powders, etc., having a value of $2,298,481.

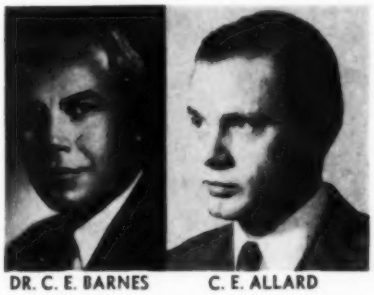
Distribution of the Canadian plants engaged primarily in the manufacture of soap was listed as follows: 25 in Quebec, 20 in Ontario, six in British Columbia, two in Alberta and one in Manitoba. These firms reported 2,589 workers with production valued at $59,747,191.

W. E. Taylor to Lever

William E. Taylor, former New York, Chicago and Washington newspaperman and magazine editor, recently joined the public relations department of Lever Brothers Co., New York.

Arnold, Hoffman Expands

The expansion of its research and sales service laboratory facilities



DR. C. E. BARNES C. E. ALLARD

and the appointment of Dr. Carl E. Barnes as director of research and Chauncey E. Allard, as associate director, was announced recently by Arnold, Hoffman & Co., Providence, R. I. Dr. Barnes was formerly associate director of the central research laboratory of General Aniline and Film Corp. Mr. Allard has been with the firm since 1942, having been in charge of general research since 1948.

New Toilet Soaps

Two new toilet soaps, one of which is the deodorant type, were introduced at a special sale at the Fair, Chicago department store, recently. "Faircrest Seven A.M." deodorant soap, which contains a deodorizing agent, was offered at eight cakes for $1.29; the regular price is $1.69. "Faircrest" mint scented cleansing cream soap, described as a bland soap, containing buttermilk, was sold during the introductory sale at 12 cakes for $1.39, the regular price being $1.89.

Arthur Hartigan (center, seated), who has been associated with Filtrol Corp., Los Angeles, since 1924, at a party held recently to mark his retirement from the firm.

Syn. Detergent Corrections

The following letter from London, Eng., was received recently by *Soap & Sanitary Chemicals*, and corrects and clarifies certain of the listings of synthetic detergent products in the article, "Synthetic Detergents Up-to-Date," by John W. McCutcheon, which was published in the August, September and October, 1949, issues:

"We have read with interest the lists of detergent products compiled by J. W. McCutcheon, which have appeared in recent issues of your journal. We should like to compliment you upon the comprehensive nature of these lists, which we are sure will prove of great value.

"We would, however, like to draw your attention to small errors which have arisen in the mention of the detergents marketed by Shell. We refer to 'Lensex,' given in your September issue, and 'Teepol' and 'Teepex' in the October issue. For the manufacturer, we note you have quoted the Shell Petroleum Company for 'Lensex' and Shell Chemicals Limited for the other two. These three products are all marketed by Shell Chemicals Limited in the United Kingdom, but, as we like all enquiries to be addressed to the Shell Petroleum Company, we should prefer that this name be given in any future editions of this list.

"The concentration of active material in 'Lensex' is quoted as 44 per cent, whilst the correct figure is 16 per cent, and the description of 'Lensex' as being 'paste form of "Teepol" and similar to "Teepex"' is somewhat misleading, as 'Lensex' is a mildly alkaline paste specially developed for the textile industry, whilst 'Teepex' is a neutral product.

"In the description of 'Teepol" it is stated that this is also available in the form of flakes or powder, but, in fact, it is available only as a liquid or a powder. The liquid contains 21 per cent active matter, whilst the powder contains 36 per cent. In the case of 'Teepex,' the active material content should be 17 per cent instead of the figure of 42 per cent, as quoted.

"Yours faithfully

"For: The Shell Petroleum
"Company Limited.
"J. A. HILL."

Lukens Advances Powers

William J. Powers, who has been acting manager of the clad and conversion sales department of Lukens Steel Co., Coatesville, Pa., since July, 1949, was recently appointed manager of the department. He has been associated with Lukens, except for a war service period of more than three years, since May, 1940, starting in the engineering department of Lukenwald division.

we can't say we know all the answers...

but we know we have soap-selling scents!

Nobody—well, almost nobody—knows why one good odor in soap appeals to more people than another good odor. But we do know, through years of experience in blending and selling, which odors have the widest appeal. Drawing upon this research and experience, we have developed a number of distinctive compositions especially designed to captivate the soap-buying public. These compositions are ready for incorporation in your finished product. You can depend on their stability, odor strength and tenacity.

Greater Distinction through

Givaudan-Delawanna, Inc.

330 West 42nd Street, New York 18, N. Y.

Branches: Philadelphia • Boston • Cincinnati • Detroit • Chicago • Seattle • Los Angeles • Montreal • Toronto

F. T. C. Acts in Soap Case

Babiglo Co., New York, was recently ordered by the Federal Trade Commission to discontinue certain claims made for the olive oil content of three of its soaps. The F.T.C. order stipulates that the company stop representing that its "Kent Castile" and "Babiglo Castile" soaps are made exclusively from olive oil unless entire oil content of the soap is olive oil. The firm is also enjoined from using the term "hospital" to refer to soap which has not been endorsed by a hospital.

In another recent F.T.C. case Merck & Co., and its subsidiary, Amuno, Inc., both of Rahway, N. J., were charged with misrepresenting the value and effectiveness of "Amuno," a patented product advertised and sold as a treatment to prevent moth and beetle damage to fabrics containing wool or rather animal fibers. Because the Secretary of Agriculture is "vested with primary jurisdiction" over some of the challenged claims, as a result of the subsequent issuance of the Federal Insecticide, Fungicide and Rodenticide Act, the F.T.C. announced that it would take no further action in the case. It is also pointed out by the F.T.C. that the record indicates that the use and dissemination of other representations alleged to be deceptive have been discontinued by the two firms and will not be resumed. The public interest does not require further corrective action now, the F.T.C. states, but the right is reserved to reopen the case or to take such action as further circumstances may warrant.

Dirr's 25th Anniversary

Peter A. Dirr, vice-president of Charles L. Huisking & Co., New York, and Mrs. Dirr observed their 25th wedding anniversary on Feb. 11. Mr. Dirr has been associated with the chemical and drug trades for about 49 years.

Dr. Oswald to Carameed

The appointment of Dr. Victor J. Oswald as technical director of its Canadian subsidiary, Carameed, Ltd., Toronto, was announced recently by Charles C. Bryan, resident partner of Firmenich & Co., New York. Perfume raw materials, specialties, and flavor division of Firmenich are under Dr. Oswald's technical supervision.

Participants in a debate at a recent meeting of the Chicago Chapter of the Society of Cosmetic Chemists were A. L. Van Ameringen of Van Ameringen-Haebler, Inc., New York, and Robert Elrick of Booz, Allen & Hamilton, management consultants. They discussed the question: "Customer acceptance of a fragrance in a toiletry can best be determined by my market survey."

Fritzsche Award Winner

Dr. A. J. Haagen-Smit of the California Institute of Technology was recently announced as the winner of the $1,000 Fritzsche Award for 1950, annually made by Fritzsche Brothers, Inc., New York. Dr. Haagen-Smith's work in the development of synthetic flavors and his being the first to identify plant hormones were cited in the award, which will be officially made at the 117th annual meeting of the Philadelphia session of the American Chemical Society.

Soaps, Cleaners Rated in 14 Markets

A 14 market brand preference survey of toilet soaps, dentifrices, shaving preparations, shampoos, synthetic detergents, toilet bowl celaners, scouring cleansers, waxes, and products for washing walls, floors woodwork, etc., was issued recently by the Milwaukee *Journal*, in collaboration with 13 other newspapers. In all, 54 cities are surveyed in the study which bears the title: "Fourteen Market Comparison of Consumer Preference." On each of the products listed is given the percentage of use of that product in each of the 14 markets.

By product categories, the following first place preferences are indicated: self-polish liquid wax and paste wax, "Johnson's," with 13 in each case; products for walls, floors, woodwork, "Spic and Span," 11; products for dishes, "Vel" and "Tide" tied for first with 4 each, "Dreft" 3, "Ivory" bar 2 and "Duz" 1; liquid rubbing wax, "Johnson's," 9; products for fine fabrics, "Lux Flakes", 11, "Ivory Flakes" 2 and "Dreft" 1; powdered scouring cleansers, "Old Dutch," 10, "Kitchen Cleanser" 1, "Bab-O," 1; synthetic detergents, "Vel" 3, "Dreft," 2, "Tide," 2; toilet bowl cleaners, "Sani-Flush," 7; cream shampoo, "Lustre Creme," 9, "Prell," 3, "Rayve," 1; liquid shampoo, "Halo," 11, "Breck," 1; brushless shave cream, "Palmolive," 5, "Molle," 4, "Colgate," 2, "Barbasol," 1; tooth powder, "Dr. Lyon's," 8, "Colgate," 5; tooth paste, "Colgate," 13; toilet soap, bath, "Lux," 6, "Palmolive," 4, "Ivory," 2, "Lifebuoy," 2; toilet soap, hands and face, "Lux," 9, "Palmolive," 4, "Camay," 1; regular shaving cream, "Palmolive," 5, "Colgate," 3, "Williams," 1.

Get these "plus" values with Wyandotte Kreelon

Free flowing flakes or powder + Guaranteed detergency

+ Lighter color + Clearer solution

+ 40% (minimum) active agent

THERE's a good chance that your products can benefit from these and other important advantages of *Wyandotte Kreelon**.

This superior detergent and wetting agent is made under rigid manufacturing specifications. It is white in color, provides maximum detergency (soil removal and whiteness retention). In addition, it dissolves faster and more completely than most other detergents.

For further details concerning the properties and applications of Wyandotte Kreelon, write us today. *Reg. U. S. Pat. Off.

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Wyandotte, Mich. • *Offices in Principal Cities*

SODA ASH • CAUSTIC SODA
BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE
CHLORINE • HYDROGEN • DRY ICE
SYNTHETIC DETERGENTS • GLYCOLS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE
PROPYLENE DICHLORIDE
AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

Wyandotte
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Woulfe Leaves Lever

Henry Woulfe has resigned his post as vice president of Lever's midwest operations. Mr. Woulfe was president of the Pepsodent division of Lever for four years, assuming his recent role in January.

HENRY F. WOULFE

P&G Honors 25-Yr. Men

Three 25-year veterans of the Procter & Gamble Co. organization in Dallas, Tex., were presented recently with diamond service pins. The three are: Clyde L. Cox, a tractor operator in the plant warehouse; James W. Yarbrough, clerk in the mechanical department; and Frederick L. Hardin, supervisor of night operations at the Dallas factory.

Hooker Executive Changes

Executive changes, announced following the annual meeting of stockholders and directors of Hooker Electrochemical Co., at Niagara Falls, N. Y., Feb. 14, included the following: Hiram B. Young, formerly superintendent of the Niagara Falls plant, is now works manager. Frank W. Dennis, formerly personnel director and employment manager, was named director of industrial relations for plants at Niagara Falls, Tacoma, Wash., and subsidiary Hooker-Detrex plants at Tacoma and Ashtabula, O. Leonard F. Bryant, formerly assistant production superintendent, is now plant superintendent and Walton B. Scott, formerly assistant technical superintendent, is now technical superintendent.

Dennis A. Riordan, assistant treasurer of Hooker Electrochemical Co., Niagara Falls, N. Y., was recently named treasurer of the company.

Colgate Strike Averted

A threatened strike at the main plant of Colgate-Palmolive-Peet Co., Jersey City, N. J., was settled early in March, following a one-day walk-out. During the walk-out workers voted to strike if wage demands were not met. The company has not had a strike in its 114 year history. An independent union claiming to represent 2100 workers asked a general five cent an hour increase, which was granted

Wheeler, Jr. Married

James Wheeler, Jr., of Essential Chemicals, Inc., Milwaukee, son of the head of the firm, was married on Feb. 4 to Miss Virginia Bade of Milwaukee. Following a Florida honeymoon, the couple are making their home in Milwaukee.

Magee Seaforth Sales Mgr.

Walter B. Magee was recently appointed sales manager for the "Seaforth" line by Alfred D. McKelvy Co., New York. He has been with the Seaforth division since last August, having previously been a buyer for L. Bamberger & Co., Newark, N. J.

WALTER B. MAGEE

Lever Personnel Shifts

Robert G. Spears, one-time product manager of Standard Brands, Inc., New York, was recently made vice-president and general manager of the Jelke Good Luck Products Division of Lever Brothers Co., New York.

H. Gordon Scowcroft, formerly with Lever, has joined Campbell Soup Co. to work on special merchandising assignments.

George Grief, formerly with Lever, recently was appointed head of A. Salzman, Inc., New York advertising agency.

N. Y. BIMS Annual Dinner

The BIMS of New York held its annual dinner at the New York Athletic Club, New York, on February 2. Two hundred members and guests were present for the traditional yearly roast beef dinner. Peter Forsman of C. H. Forsman Co., chairman, presided. The BIMS 1950 golf tournament schedule was announced at the gathering as follows: June 20, Ridgewood Country Club, Ridgewood, N. J.; July 18, Wheatley Hills Golf Club, Wheatley Hills, Long Island; August 22, Winged Foot Golf Club, Mamaroneck, N. Y.

The newly elected officers of the Chicago Chapter of the Society of Cosmetic Chemists for the year 1950 are, reading left to right, Dr. Joseph Schultz, Lady Esther, Ltd., chairman; Dr. Katherine Graham, Sears, Roebuck & Co., secretary; Mr. W. E. Lieb, Allen B. Wrisley Co., treasurer; and Dr. H. Heinrich, Kolmar Labs., Inc., vice-president.

RAW MATERIAL MARKETS

As of March 8, 1950

FATS and oils prices during the past month were characterized by advances. No prices declines were reported as of this date, as compared with the levels of the similar date in February. With the exception of copra and coconut oil, price quotations on which remain unchanged, all other fats and oils prices are higher than a month ago. At that time, prices were also above the previous month's level.

Tallow, currently quoted at 6⅝ cents, is up a quarter of a cent from the February price. With copra remaining at $192.50 a ton, Pacific Coast basis, the price of coconut oil, 14½ cents a pound, is also unchanged from a month ago. Lard at .1080 cents has advanced from the comparable February figure of .1042 cents.

The vegetable oil price advance was on an overall basis, with cottonseed moving forward from 11 to 13 cents; corn oil in the past 30 days has gone from 12½ cents to 13¾ cents; soybean oil, crude basis, at the current listing of 12½ cents, is up one and-half cents from the earlier figure; peanut oil, now bringing 14¾ cents, has climbed one and one-quarter cents since the comparable date in February.

Current prices of fats and oils are now higher in some cases than they were a year ago, a situation which has not obtained for the past several years. Tallow, however, is one and three-eighths cents under the March, 1949 figure of eight cents.

Reflecting the upward trend in prices of fats and oils, two soap companies recently announced increases in the prices of the shortenings. Soap prices remain unchanged. Further shortening increases are in sight, according to some sources, in view of the upward price trend in fats and oils. Cottonseed oil, for example, is currently four cents over the price prevailing in November; soybean is three cents higher now than four months ago, while other oils and lard are gradually moving to higher levels.

According to the *Fats and Oils Situation,* published by the U. S. Department of Agriculture, "strong export demand for lard, edible vegetable oils and inedible tallow and grease has been a major factor in the slight upward trend in prices of these items since the lows of early November, 1949. Also, demand in the domestic market apparently has strengthened in recent months."

No major rise in the general level of prices of fats and oils in the next few months is foreseen by the U.S.D.A., which cites high levels of production and reduced exports. Coupled with possible lower domestic consumption these factors should tend to brake any substantial price rises.

Coconut oil, which has soap users somewhat "edgy," came to the U. S. in slightly larger volume in 1949 than in the previous year. However, the soap industry is finding competition in buying from the Munitions Board, which is reported stockpiling of coconut, palm, and castor oils. Imports of these materials in the Jan.-Nov., 1949 period were put at 498 million pounds of copra, 109 million pounds of coconut oil (as against 109.1 million pounds in 1948), 78 million pounds of palm oil (as compared with 63.3 million pounds in 1948), and 109 million pounds of castor oil. Imports of all fats and oils in November were larger than for any other month since December, 1948, according to the U.S.D.A. Total imports in the January-November, 1949 period, including oil equivalent of oil seeds, was 1,014 million pounds, compared with 1,103 million pounds a year earlier.

Factory consumption of major fats and oils increased in January of this year, as against December, according to the Bureau of the Census of the Department of Commerce. Consumption of both coconut (crude and refined) and tallow (refined inedible) rose in January, as compared with December. Coconut oil consumption amounted to 46,743,000 pounds in January as compared with 42,726,000 pounds in the previous month for the crude, and 130,317,000 pounds and 119,251,000 pounds for the refined for January and December, respectively. Refined inedible tallow consumption was put at 28,215,000 pounds for January, as against 25,-051,000 pounds in the previous month, inedible tallow use was put at 111,-648,000 pounds and 111,063,000 pounds for January and December, respectively.

Production of fats and oils will continue at record or near record levels in the remainder of the 1949-50 crop year, and probably will be large again in 1950-51. The expected increase of about six per cent in the 1950 pig crop presages a moderate increase in lard and grease output next fall and winter over the large production in the current season.

Exports of fats, oils and oil equivalent of oilseeds in November, 1949 totaled 194 million pounds, which was the highest since July and was 84 per cent greater than in November, 1948, but was well under the unusually high monthly average in January-July, 1949. The total for the Jan.-Nov., 1949 period was 2,139 million pounds, as against 834 million pounds a year earlier. Of the total for the first 11 months of last year were 394 million pounds of inedible tallow and greases and 558 million pounds of lard.

NEW TRADE MARKS

THE following trade-marks were published in the February issues of the *Official Gazette* of the United States Patent office in compliance with Section 6 of the Act of February 20, 1905, as amended March 2, 1907. Notice of opposition must be filed within thirty days of publication. As provided by Section 14, a fee of ten dollars must accompany each notice of opposition.

Mineralistic—This for bowling alley finish. Filed May 8, 1948 by Brunswick-Balke-Collender Co., Chicago. Claims use since June 15, 1943.

Bactine—This for topical germicide. Filed Dec. 13, 1948 by Miles Laboratories, Inc., Elkhart, Ind. Claims use since Dec. 3, 1948.

Hypodee—This for insecticide. Filed Aug. 4, 1949 by Hydroponic Chemical Co., Copley, O. Claims use since May 28, 1946.

Hydronox — This for insecticide. Filed July 1, 1948 by Farnam Co., Omaha. Claims uses ince Mar 15, 1948.

Deocide—This for germicidal deodorant and disinfectant. Filed Oct. 13, 1948 by Sandack Corp., Chicago. Claims use since Sept. 8, 1948.

Faime—This for hair shampoo. Filed Aug. 23, 1948 by Allied Pharmetics Co., Plainfield, N. J. Claims use since Aug. 15, 1946.

Ninol—This for surface active agents. Filed Apr. 26, 1948 by Ninol Laboratories, Chicago. Claims use since Sept. 1, 1934.

Hardnox Alkali—This for inorganic detergent. Filed July 22, 1948 by Diamond Alkali Co., Cleveland. Claims use since Jan. 1, 1937.

Hitest Alkali—This for inorganic detergents. Filed July 22, 1948 by Diamond Alkali Co., Cleveland. Claims use since Jan. 1, 1937.

Velva Seal—This for wall sealing preparations. Filed Nov. 23, 1948 by Foy Paint Co., Cincinnati. Claims use since 1931.

Sturman's—This for dry cleaner in the form of a volatile fluid. Filed Oct. 16, 1948 by Sturman Manufacturing Co., Kansas City, Mo. Claims use since Jan. 15, 1926.

House of Hollywood—This for shampoo. Filed Aug. 5, 1948 by House of Hollywood, Los Angeles. Claims use since Oct. 5, 1935.

Lucien LeLong—This for soap. Filed Aug. 1, 1947 by Lucien LeLong, Inc., Chicago. Claims use since December, 1928.

Ramco—This for insecticides. Filed Aug. 2, 1948 by R. A. Myers & Co., St. Paul, Minn. Claims use since Jan. 1, 1929.

Atmul—This for wetting agent. Filed Sept. 29, 1948 by Atlas Powder Co., Wilmington, Del. Claims use since Aug. 30, 1948.

Atax—This for surface active agent. Filed Oct. 28, 1948 by Atlas Powder Co., Wilmington, Del. Claims use since Oct. 20, 1948.

Swift Floor—This for floor patching compound. Filed Nov. 28, 1947 by Monroe Co., Cleveland. Claims use since January, 1945.

Acto—This for metal cleaning compounds. Filed Mar. 19, 1948 by Stanco, Inc., New York. Claims use since Oct. 18, 1918.

Sprite—This for liquid synthetic detergent. Filed May 29, 1948 by Sinclair Manufacturing Co., Toledo. Claims use since May 12, 1948.

Niatox—This for insecticidal composition. Filed May 22, 1947 by Food Machinery Corp., San Jose, Calif. Claims use since Oct. 1, 1945.

Painticide—This for insect killing paints. Filed Dec. 21, 1946 by Clyde A. Farr, Baton Rouge, La. Claims use since Oct. 15, 1946.

Fiendspray—This for insecticides. Filed June 5, 1946 by McCambridge & McCambridge Co., Baltimore. Claims use since Aug. 24, 1945.

Di-Tick—This for liquid or powder insecticide. Filed Mar. 23, 1945 by Belco Chemical Products Co., New York. Claims use since Jan. 10, 1945.

Fuller — This for polishing cloths. Filed Feb. 6, 1948 by Fuller Brush Co., Hartford, Conn. Claims use since Nov. 1, 1920.

Fentone — This for shampoo. Filed Nov. 13, 1948 by Catherine C. Fenton, Waterbury, Conn. Claims use since Nov. 9, 1928.

Metex—This for metal cleaners. Filed Jan. 17, 1949, by MacDermid Inc., Waterbury, Conn. Claims use since Aug. 3, 1922.

Latoja—This for toothpaste and shampoo. Filed Apr. 23, 1948, by Sociedad Anonima "La Toja," Pontevedra, Spain. Claims ownership of Spanish Registration No. 118,133, dated Dec. 11, 1942.

Toboggan—This for dentifrices. Filed Oct. 26, 1949, by Les Parfums Brisson, Paris, France. Claims ownership of French Registration No. 390,-166, dated Dec. 9, 1948.

Enchantment—This for shampoo. Filed July 8, 1949, by the De Pree Co., Holland, Mich. Claims use since June 15, 1940.

Cyl-Dent — This for dentrifrice. Filed Sept. 20, 1948, by Skin-Tested Drug Products, Inc., New York. Claims use since Apr. 12, 1948.

Amami—This for shampoos and tooth powder. Filed Dec. 8, 1948, by Prichard & Constance, Inc. Claims use since June, 1909.

Dir-Toff—This for liquid soap. Filed Apr. 2, 1947, by Higley Chemical Co., Dubuque, Iowa. Claims use since Mar. 8, 1929.

Whink—This for powdered soap. Filed Oct. 9, 1948, by Whink Products Co., Eldora, Iowa. Claims use since Feb. 24, 1948.

O-So-Ezy—This for polishes and waxes for furniture, walls, floors, and automobiles. Filed July 26, 1947, by O-Cedar Corp., Chicago, Ill. Claims use since Sept. 30, 1913.

Nairn—This for wax preparation for polishing floors. Filed Feb. 5, 1948, by Congoleum-Nairn, Inc., Kearny, N. J. Claims use since Mar. 3, 1939.

Wincide—This for disinfectants, bactericides, and moth sprays. Filed Mar. 24, 1948, by Industrial Soap Co., St. Louis, Mo. Claims use since Feb. 27, 1945.

Mil-Dont—This for control of mildew and other fungus growths. Filed May 26, 1948, by Chemspecs Laboratory, Cranford, N. J. Claims use since Dec. 22, 1947.

Lathanol—This for alkali sulfonate for use in manufacture of dentifrices and other toilet preparations. Filed June 9, 1948, by Allied Chemical & Dye Corp., New York. Claims use since May 1, 1948.

Kuhls—This for fungistatic and insecticidal control of decay, mildew and insects in wood. Filed July 14, 1949, by H. B. Fred Kuhls, Brooklyn, N. Y. Claims use since 1890.

Penfluor — This for insecticides. Filed Dec. 17, 1948, by Pennsylvania Salt Manufacturing Co., Philadelphia, Pa. Claims use since Oct. 14, 1948.

Dee Aitch—This for insecticides and rodenticides. Filed Jan. 11, 1949, by Daly-Herring Co., Kinston, N. C. Claims use since Feb., 1947

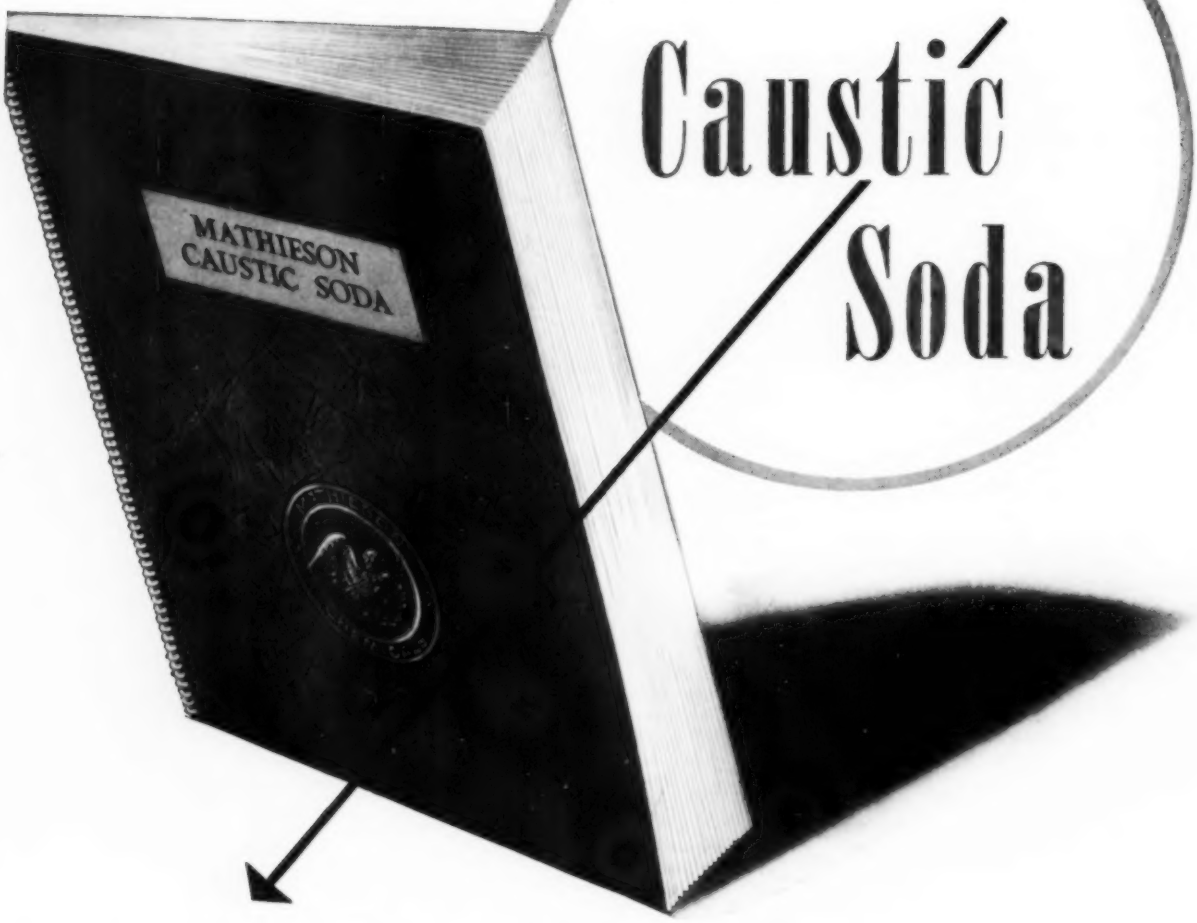
Cuir du Canada—This for toilet soap. Filed Dec. 3, 1948, by Les Parfums De Dana, Inc., New York. Claims use since Nov. 26, 1948.

Whiterightoff—This for cleaner for white shoes. Filed Dec. 2, 1948, by George J. Kelly, Lynn, Mass. Claims use since Feb. 2, 1917.

Prep—This for chemical preparation for cleaning metal surfaces to receive paint. Filed June 29, 1946, by Neilson Chemical Co., Detroit, Mich. Claims use since Jan. 2, 1937.

The report on newly elected officers of the Albany Soap Corp., Albany, New York, in the Feb. issue should have announced Mrs. Madeline Grober as president. She succeeds her husband, the late Joseph E. Grober, who died Dec. 18, 1949.

for users of Caustic Soda



• This completely new 48-page book entitled "Mathieson Caustic Soda" is now available to users throughout industry. Fully illustrated, it covers in detail the manufacture, economics, properties, handling and sampling of this product.

In 1923, Mathieson was the first to make regular shipments of caustic soda in liquid form. Today, because of the expanded productive capacities of its three large plants at Saltville, Va., Lake Charles, La., and Niagara Falls, N. Y., Mathieson is recognized as one of the leading suppliers of liquid caustic soda.

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SERVING INDUSTRY, AGRICULTURE AND PUBLIC HEALTH

NEW PATENTS

Conducted by

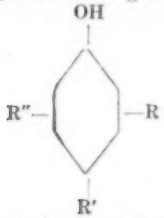
Lancaster, Allwine & Rommel

PATENTS, TRADEMARKS AND COPYRIGHTS

402 Bowen Building, Washington, D. C.

Complete copies of any patents or trade-mark registration reported below may be obtained by sending 50c for each copy desired to Lancaster, Allwine & Rommel.

No. 23,168, Stabilized Pyrethrin Insecticide, patented by Herschel G. Smith, Wallingford, and Mark L. Hill, Boothwyn, Pa., assignors to Gulf Oil Corporation, Pittsburgh, Pa., a corporation of Pennsylvania. Covered are improved, stable pyrethrin-containing insecticides, stabilized against deterioration by light, the improved insecticide compositions comprising a pyrethrum extract in a hydrocarbon solvent containing a minor amount of a 2,4,6-trialkylated monohydroxy phenol having the following formula



wherein R and R" represent tertiary butyl groups and R' represents an alkyl group selected from the class consisting of methyl and tertiary butyl groups, the amount of said tri-alkylated phenol being sufficient to stabilize the pyrethrin-containing insecticide against deterioration by light and air and to inhibit loss of insect killing efficiency when exposed to light and air.

No. 2,487,799, Germicidal Soap, patented by William S. Gump, Montclair, N. J., assignor to The Givaudan Corporation, a corporation of New Jersey. The patent covers a germicidal soap essentially comprising a detergent soap and 2,2'-dihydroxy-5,5'-dibromo diphenyl.

No. 2,490,459, Paste Shampoo, patented by Werner Max Lilienfeld, Chicago, Ill., assignor to The Emulsol Corporation, Chicago, Ill., a corporation of Illinois. The patent describes an improved shampoo, in the form of a paste, comprising a mixture of from about 10% to about 25% of a water-soluble salt of a sulfate of a higher fatty acid amide of a hydroxy-alkyl primary amine having good detergent properties, in which the higher fatty acid radical contains from 8 to 18 carbon atoms, from about 9% to about 20% of a water-soluble inorganic salt, from about 1.5% to about 6% of a fatty acid amide of monoethanolamine in which the fatty acid contains predominantly from 12 to 14 carbon atoms, and not substantially less than 50% of water.

No. 2,490,089, Method and apparatus for Treating Soap Products, patented by Thomas Penny, Brimstage, Bebington, England, assignor to Lever Brothers Company, Cambridge, Mass., a corporation of Maine. A continuous method for enhancing the gloss and transparency of soap flakes is patented, which comprises passing preformed solidified flakes of soap through a steaming zone in which they are freely exposed to the action of steam for not more than a few seconds and then passing them through a drying zone in such manner that they are kept substantially separate from one another until their surfaces have become sufficiently dry to prevent them from sticking together when they are collected. Apparatus for imparting an enhanced gloss and transparency to soap flakes, comprising a tower, means to feed soap flakes to the top of said tower and to permit them to fall in a uniform stream down the interior thereof, and means to remove or permit the removal of soap flakes from the lower part of said tower, together with means intermediate said first and second means, for admission of steam to the top part of said tower to establish a steaming zone therein, said means comprising a set of steam emitting means opposing each other and spaced apart to permit the flakes to pass therebetween to be steamed thereby, and means to admit a current of air to the lower part of said tower and to withdraw it from the upper part thereof, so as to establish a drying zone in the lower part of said tower.

No. 2,490,437, DDT in Petroleum Solvent Stabilized with Lanolin and Dimerized Eighteen Carbon Atom Fatty Acids, patented by John C. Hillyer, Bartlesville, Okla., assignor to Phillips Petroleum Company, a corporation of Delaware. Covered is a solution of DDT and a petroleum solvent containing sufficient DDT to be supersaturated at —10° F. and also containing dissolved therein at least 0.5 weight per cent of dimerized mixed C_{18} fatty acids. A solution of DDT and a petroleum solvent containing sufficient DDT to be supersaturated at —10° F. and also containing dissolved therein at least 0.5 weight per cent of lanolin.

No. 2,491,468, Lime Treated Sabadilla Seed Insecticide, patented by Thomas C. Allen, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis., a corporation of Wisconsin. An insecticide is patented in which the active ingredients are powdered Sabadilla seed and hydrated lime.

No. 2,487,611, Purification of Glycerin, patented by Francis J. Sprules, Arlington, N. J., and Raymond Liebling, Brooklyn, N. Y., assignors to Nopco Chemical Company, Harrison, N. J., a corporation of New Jersey. The patent describes a process for refining glycerine obtained by transesterification of a fatty material wherein the transesterification process is catalyzed by an alkaline catalyst followed by esterification with an acid catalyst, the steps comprising neutralizing the acidic glycerine with an alkaline earth carbonate, treating the glycerine with an alkaline earth halide, and then separating the glycerine from insoluble material formed therein.

No. 2,494,127, Method of Producing Toilet Soap, patented by John Karl Oskar Hubert Holmberg, Stockholm, Sweden. The patent describes the method of producing a millable soap directly with the saponification with alkali of fatty acid esters of such alcohols that have a lower boiling point than water under the saponification conditions employed, which method comprises saponifying such fatty acid esters with alkali in the presence of a liquid diluent for the soap and at a temperature at which the charge is from semi-liquid to liquid above the boiling point of the alcohol liberated from the esters and not in excess of about 125° C., said diluent being volatile under the saponifying conditions and having a boiling point over that of the alcohol liberated from the esters, distilling off the alcohol liberated from the esters, distilling off the alcohol liberated from the esters, and continuously fractionating the vapors evolved during the saponification as they are evolved to rectify off the alcohol liberated from the starting ester and drawing it off separately while returning the diluent fraction as the reflux to the reaction mass, the diluent having been included in a quantity substantially equal to that desired in the soap produced and ad-

(*Turn to Page* 95)

Detergent Developments

(*From Page* 49)

salt. A wide variety of sulfonate detergents are produced by heating long chain aliphatic halides or olefins in a polar solvent with a salt of sulfurous acid at atmospheric or superatmospheric pressure until reaction is complete. Recently the I. G. Farbenindustrie developed on a commercial scale a superior continuous process for preparing sulfonated detergents which involves treating a saturated hydrocarbon with sulfur dioxide and oxygen in the presence of actinic light, or an acid chloride acid anhydride or ketone as a catalyst.

Cationic Detergents

THE detergents discussed thus far have contained long-chain surface active anions. Some detergents, mostly long chain amine, quaternary ammonium, or pyridinum salts, contain surface active cations. Amines are produced commercially by the hydrogenation of nitriles in the liquid phase at moderate temperatures (50° to 200° C.) and high pressures using a cobalt or nickel catalyst. Nitriles are obtained by passing ammonia into fatty acids at temperatures somewhat below their boiling points. Pyridinium salts are made by heating long chain alkyl halides with pyridine.

The products commercially known as *Sapamines* are salts of complex amines prepared by condensation of oleic or other fatty acids with unsymmetrical diethyl ethylene diamine and, in many cases, alkylating the quaternary salt formed with benzyl chloride or methyl sulfate to increase their stability to lime or other alkalies. These products foam in concentrations as low as one half part per million. They are effective wetting agents and detergents in neutral or acid solutions.

Commercially available cationic detergents include Armour's long chain amines and their salts, and their alkyl trimethyl ammonium salts (*Arquads*) of the same series of chain lengths and lauryl and cetyl pyridinium halides made by the Hooker Chemical Co. and others. Winthrop Chemical Co.'s *Roccal* or *Zephiran* are 10 or 50 per cent solutions of alkyl dimethyl benzyl ammonium chlorides, with the alkyl groups being obtained from coconut fatty acids.

The long chain quaternary ammonium salts, such as cetyl ammonium chloride were first studied by Krafft in 1896 and later by Reychler in 1913. They are expensive detergents but their potent germicidal action has caused them to be used more and more for this latter purpose. The high affinity of the long chain amines for negatively charged or siliceous surfaces leads to their application in flotation. Cationic detergents are used in the textile industry in finishing and sizing because they combine with both cotton and wool fabrics to give soft, smooth, flexible, permanent finishes. They precipitate anionic dyestuffs, increasing their fastness to washing and allow the use of direct substantive wool dyes on cotton. *Zelan* A is a long chain quaternary ammonium compound which combines with textiles to give a durable water repellent finish.

Nonionic Detergents

WITHIN recent years detergents have become available which do not form ions in aqueous solution. These consist of hydrophobic chain or ring compounds which have been made water soluble, although not completely lyophilic, by reaction with polyhydroxy compounds such as are formed by the condensation of ethylene oxide. An early product of this type is the I. G. Farbenindustrie and General Dyestuff's *Emulphor O* which is a condensation product of oleyl alcohol and ethylene oxide. Other nonionic detergents are produced by condensing ethylene oxide with fatty and rosin acids, amides, amines, and alkylated phenols. For example, Rohm & Haas' *Triton* X-100 is a condensation product of diisobutyl phenol with 9 or 10 molecules of ethylene oxide and has an average molecular weight of 600.

Among other types of nonionic surface active agents are the water-insoluble fatty monoglycerides made by the reaction of fats and oils with glycerin in the presence of soap as a catalyst. They are used in cosmetics and in the commercial frying of doughnuts to control browning. When glycerin is heated to 200° to 300° in the presence of sodium hydroxide or other suitable catalyst, di-, tri- and various poly glycerols are formed. When both straight and cyclic polyglycerols containing an average of 5 or 6 glycerols per molecule are partially esterified with a fatty acid, the resulting product is water soluble, does not precipitate in hard water, and is a good detergent in neutral, and mildly acid and alkaline solution.

Still other types of nonionic surface active agents are the fatty esters of poly alcohol anhydrides (*Spans*) and the poly oxyethylene derivatives of poly alcohol anhydrides and their esters (*Tweens*) produced by the Atlas Powder Company. The polyhydric alcohols used are sorbitol or other penta- or hexahydric alcohols produced by the electrolytic or high pressure catalytic hydrogenation of glycose or "cerulose" and other sugars. These are used mainly as wetting, emulsifying, and surface active agents rather than detergents.

Hundreds of patents have been issued within the past fifteen years describing many types of wetting and sudsing agents and detergents. Each of these may describe thousands of possible compounds and the number of possible cationic, anionic or non-ionic detergents is almost endless. Many of these have complicated structures and are expensive to produce. Others are relatively cheap but not very efficient, of poor quality, and difficult to purify. In this latter class are the residues from the sulfuric acid refining of petroleum to produce white mineral oils. These "mahogany soaps" are dark colored, impure sulfonation products, largely of the aromatic and naphthenic constituents. Interesting detergents result from the condensation of fatty acids with degraded proteins. These are commercially available under such trade names as *Maypon*. (Part III will appear in the next issue).

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Unsaturation can be determined by microhydrogenation with the aid of apparatus and a method described. The simple design of apparatus is made possible by use of magnetic stirring to agitate the reaction mixture. C. L. Ogg and F. J. Cooper, *Anal. Chem. 21*, 1400-1402 (1949).

BIDS AND AWARDS

Misc. P. O. Supply Awards

Awards on miscellaneous supplies in a recent opening of the Post Office Department, Washington, D. C., went to the following: Murro Chemical Co., New York, with a bid of $1.55 a hundred pounds on 80,000 pounds of sweeping compound; Kem Products Corp., Brooklyn, with a bid of 45 cents a gallon on 700 gallons of floor wax; Day & Frick, Philadelphia, who bid 4.7 cents on 700 pounds of grit soap; Kamen Soap Products Co., New York, with a bid of 9.3 cents on 50,000 pounds of floating toilet soap; R. M. Hollingshead Corp., Camden, N. J., with a bid of 39 cents on 1,200 gallons of metal polish; Bri-Test, Inc., New York, with a bid of 39.4 cents on 1,200 gallons of liquid polish; Trio Chemical Works, Brooklyn, with a bid of $3.10 a gallon on 200 gallons of bronze cleaner.

Soap Dispenser Bids

Among the bids received on an unspecified quantity of soap dispensers in a recent opening for miscellaneous supplies by the Philadelphia Navy Department, Aviation Supply Office, Philadelphia, were those of: Jos. E. Frankle, Philadelphia, items 1a through f, $2.25, alternate, $1.25; Noland Co., Washington, D. C., items 1a through d, $2.4465, e, $1.27, f, $1.20; U. S. Sanitary Specialties Co., Chicago, items 1a through f, $1.25; Moore Brothers Co., New York, items 1a through f, $2.25; Selig Co., Atlanta, Ga., items 1a through f, $2.75; Manhattan Lighting Equipment Co., New York, item 1a, $2.17, b, $2.28, c and d, $2.16, e, $2.17 and f, $2.12.

Fed. Disinfectant Bids

The following bids were received in a recent opening for miscellaneous supplies by the Federal Service Supply, Washington, D. C., on an unspecified quantity of disinfectant: Trio Chemical Works, Brooklyn, items 51-D-392, 62.5c, item 393, 49.3c, item 394, 44.4 cents, all for Washington, D. C., and item 395-10, Cleveland, 65c, Chicago, 69c, Boston, 60.8c, New York, 55.5c, Denver, 84c, item 395-15, Kansas City, 64c, Los Angeles, 74c, item 395-55, Cleveland, 49c, East Point, Ga., 51c and New York, 38.5c; Selig Co., Atlanta, item 395-10, East Point, Ga., 66c, item 395-15, Fort Worth, 65c; Fine Organics, Inc., New York, item 395-15, New York, 44c.

Toilet Bowl Cleaner Bids

Bids on an unspecified quantity of toilet bowl cleaner (item 51-C-1313-485) for a, Cleveland, b, Kansas City, c, Denver, d, San Francisco and e, Seattle, in a recent opening for miscellaneous supplies by the Federal Service Supply, Washington, D. C., were received from: City Chemical Corp., New York, a, 25c, b, 26c, c, 30c, d, 28c, e, 29c; for entire award; Wm. Messer Corp., New York, a, 12c in 22 oz. containers, b, 14c, c, 16c, d and e, 15c, for entire award; R. M. Hollingshead Corp., Camden, N. J., a, 18.2c, 22 oz., b, 19.6c, c, 21.6c, d and e, 21.3c, all or none; Air Purification Service of Indiana, Indianapolis, a, 14.5c, 22 oz., b, 15c, c, 15.875c, d and e, 19c; Imperial Products Co., Philadelphia, a, 12.5c, 22 oz. globular type, b, 14c, c, 15.5c, d and e, 16.5c.

Misc. P. O. Awards

The following awards were announced in recent openings for miscellaneous supplies by the Post Office Department, Washington, D. C.: 100,000 pounds of cleaner for painted surfaces, Phipps Products Corp., Painesville, O., item 1, 6.5 cents a pound, item 2, 5.5 cents; 900 gallons of water-emulsion floor wax, Trio Chemical Works, Brooklyn, 48 cents per gallon; 15,000 cakes of grit soap, Colgate-Palmolive-Peet Co., Jersey City, N. J., 3.419 cents each.

AQM Metal Polish Awards

Awards on 25,000 pints of liquid metal polish in a recent opening for miscellaneous supplies by the Army Quartermaster Corps, Washington, D. C., went to the following: Bri-Test, Inc., New York, 7,000 pints, 9.8 to 15 cents; AMR Chemical Co., Brooklyn, 500 pints, 9 cents; Trio Chemical Works, Brooklyn, 17,500 pints, 10.54 to 14.9 cents.

Dishwash. Awards

In a recent opening for miscellaneous supplies by the Army Quartermaster Corps, New York, the following awards were announced on dishwashing compound: Wm. Messer Corp., New York, item 1, 195,000 cakes, 3.8672 to 4.078 cents; Cowles Chemical Co., Cleveland, item 2, 332,000 pounds, 8.17 to 10.21 cents.

Navy Award to Cowles

Cowles Chemical Co., Cleveland, O., received the award on 600,000 pounds of dishwashing compound with a bid of 7.6 cents a pound in a recent opening for miscellaneous supplies by the New York Navy Purchasing Office, New York.

ASO Wax and Polish Bids

In a recent opening for miscellaneous supplies by the Navy Dept. Aviation Supply Office, Philadelphia, the following bids were received on an unspecified quantity of wax and polish: Huntington Laboratories, Huntington, Ind., item 2, $1.30 a gallon; R. M. Hollingshead Corp., Camden, N. J., item 2, 94 cents a gallon; Walter G. Legge Co., New York, item 1, $3.10 per gallon, item 2, $2.20; Penetone Co., Tenafly, N. J., item 1, $2.30 a gallon and Ace Chemical Co., Newark, N. J., items 1 and 2, $1.18 a gallon.

Talks on Management

Robert B. Semple, president of Wyandotte Chemicals Corp., spoke on the subject of "Transition to Management Thinking," at the national meeting of the Chemical Market Research Association, held at the Hotel Statler, Detroit, Feb. 2. In his talk, Mr. Semple described the functions of management and explained how the managerial responsibility of today differs from that of some years ago.

Chelating Agents

(*From Page 47*)

fatty acids are not precipitated and the alkalinity is not high enough to affect the scalp.

Samples of this type of hair rinse were submitted to a mid-western University for tests. A report was received stating that the rinsing properties were excellent, but that a tendency was noted for the hair to become lighter in color. Since we had never observed such action and knew that our chelating agent had no oxidizing or bleaching power, we were hard put to give an explanation. A soap man with whom we were discussing the problem said more or less in jest, "Well, maybe it's the first time they saw really clean hair!" Upon further investigation, this was actually found to be the case. When the dulling film was removed from the surface of the hair, the natural sheen looked artificially bright. To satisfy any curiosity about this film, may we suggest the following experiment. When someone finishes washing and rinsing his hair in the ordinary way, ask him to rinse it again in water which contains one tablespoon of organic chelating agent per gallon. From this rinse a considerable amount of soap lather is obtained which can come only from the hair and which would ordinarily remain there. The sequestering agent itself will not foam or lather. The final rinse should be plain water. The actual amount of chelating agent recommended in the rinse water depends in large part on the hardness of the local water supply. The tablespoon mentioned above will sequester 10 grains of calcium as the carbonate. If we assume the water to have a hardness of five grains per gallon, then the residual organic chelating agent dissolves an additional five grains of calcium carbonate or 30 grains of calcium soap.

Special methods of analysis are available for the determination of ethylene diamine tetra acetic acid, tetra sodium salt in any form or in any quantity down to 0.001 per cent.

Recently a new compound was developed by our firm which has the property of inactivating ferric iron as well as the common divalent metals. This chelating agent, while not primarily designed for use in soap, has found its place in liquid soaps which are diluted with water containing appreciable amounts of iron. Such a condition is not encountered very often but should it prove troublesome to you, there is a solution available.

Graustein With Lever

Lever Bros. Co. has announced the appointment of Archibald R. Graustein, Jr. as director of market research. Mr. Graustein has been director of market research with Thomas J. Lipton, Inc. since his release from the U. S. Navy. He was with Lever Bros. in 1937 to 1942 when he left for the service.

Kennedy Joins Continental

The appointment of John J. Kennedy, Jr., to the post of assistant treasurer for Continental Can Co., New York, was announced recently by Hans A. Eggerss, president. Mr. Kennedy, formerly on the investment staff of J. P. Morgan & Co., New York, reports to Sherlock McKewen, secretary-treasurer of Continental.

New "Listerine Toothpaste" jumble counter basket display features real cigarette in the lithographed cardboard hand of the smoker. Einson-Freeman, Long Island City, created and produced the display for Lambert Pharmacal Co., St. Louis.

Form Emtec Research Labs.

Formation of Emtec Research Laboratories in Stamford, Conn., for the purpose of product testing and product development, was announced recently by Dr. Samuel Machlis. The laboratories are being operated under the direction of Edwin B. Michaels. Both men were formerly co-directors of the product testing and institutional research program carried on for the American Hotel Association by York Research Corp.

John F. Bartlett is Dead

John F. Bartlett, 60, who retired Dec. 1, last as treasurer and assistant secretary of Hooker Electrochemical Co., Niagara Falls, N. Y., died Jan. 28.

P & G Earnings Rise

An increase in its earnings for the six months ended Dec. 31, 1949, was reported recently by Procter & Gamble Co., Cincinnati. For the period the firm's operations resulted in a consolidated net profit of $32,904,891, after provisions for all charges and taxes, equal to $5.09 per share on the common stock. Consolidated net profit in the comparative 1948 period was $25,938,043, or $4.03 per common share.

In making his report to the stockholders, R. R. Deupree, chairman of P&G, stated that provisions for U. S. and foreign taxes for the period were $18,975,000. Approximately $45,000 was paid to employees in the Cincinnati area in profit-sharing dividends in 1949. For all U. S. and Canadian plant employees such distributions totaled $1,305,735.

Celebration of the 123rd semi-annual dividend payment was held Jan. 28 at the Cincinnati Garden for employees of the Ivorydale and St. Bernard, O., plants, also general office workers. About 5,000 persons attended the profit-sharing observance, started 62 years ago. Since that time more than $27,000,000 in dividends has been paid employees, who now either own outright or have in their name 112,344 shares of the firm's common stock. The meeting was addressed by Mr. Deupree and F. J. Reid, superintendent of the Ivorydale factory.

PRODUCTION SECTION

Chemical Bleaching of Tallow

Recognized as an efficient bleaching agent, chlorine dioxide has not been used widely because of difficulty in handling. Hints on its safe use and production are indicated.

ONE of the newer methods of chemical bleaching of tallow and fats involves the use of chlorine dioxide, which is generated at the point of operation by reacting sodium chlorite with chlorine acid or gas. Although chlorine dioxide had been recognized as as efficient bleaching agent some time ago, it was not used generally in commercial production because it is unstable, and cannot be shipped or stored. It must be produced as required in low concentrations for immediate application. The gas is spontaneously explosive in concentrations over 10 per cent. Chlorine dioxide is produced commercially by two types of generators. One, a dry type operation employing a high capacity generator, combining a solid and gas, is popular in the fat industry. The other is a wet type generator and has a lower gas capacity. It uses a solution with a gas reaction system, and finds its widest application in the oil and fat processing industry.

The dry generator has a vertical tower packed with 90 to 100 pounds of sodium chlorite. A pipeline entering the bottom of the tower introduces a two per cent chlorine-in-air mixture. At the top of the tower another pipeline leads to the reaction chamber and carries a four per cent chlorine-in-air mixture.

The wet type generator operates on the principle of accurate metering and proportioning of air, chlorine and chlorite solution.

Chlorine dioxide is a very difficult gas to store and handle. In concentrations below six per cent, at atmospheric pressures, its toxic hazards are about those of chlorine; while at concentrations over 10 per cent, it is spontaneously explosive. Its color may range from a greenish yellow to a red yellow. The material possesses an irritating odor. Soluble in water, chlorine dioxide is very reactive, and is a strong oxidizing agent. Sodium chlorite is an orange salt with a density of 56 pounds per cubic foot. It is shipped in 100 pound quantities, packed in metal containers with asbestos gaskets.

Fire, Explosion Causes

PAST experiences indicate that fires and explosions resulting from the production of chlorine dioxide have been caused primarily by increased concentrations of the material. In one case, an excess of chlorine was introduced at the start of the operation, so that the generator was overheated and a dangerous quantity of chlorine dioxide formed. In another case, the air compressor broke down, reducing the air supply to the chlorite tower which resulted in an increased chlorine dioxide concentration. In still a third case, careless handling of the sodium chlorite solution was responsible for a flash fire when the water evaporated.

Precautions recommended for safe operation and installation include the following:

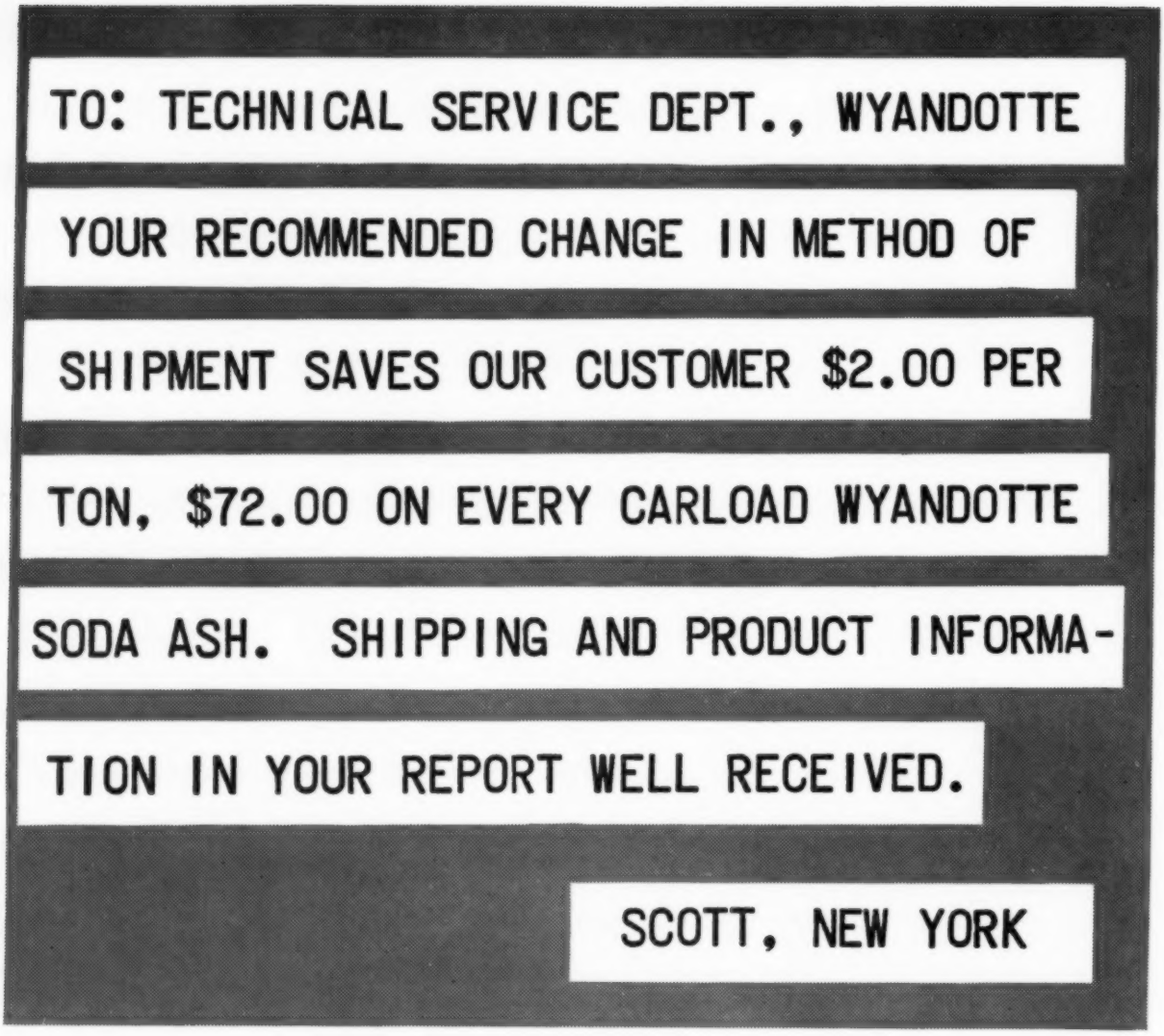
1. The dry generator tower should be located in a noncombustible building equipped with sprinklers at least 50 feet from the plant.

2. The wet generator should be located in a dust free area with sprinklers available.

3. All electrical equipment used in connection with the generator should be approved and made to comply with the National Electric Code.

4. The floor area in the vicinity of the generator should be protected against spillage of solution or flakes. A basin of water proof, noncombustible material having a four inch curb should be located beneath the generator.

Suitable instructions as to safe operation of unit and chemicals should be posted. Operation of the generator should be supervised by a qualified operator. Safety equipment should be readily available. An operator should be stationed at the instrument panel for regular observation of gauges and meters. These and other precautions, if observed, should result in the safe production of chlorine dioxide. *Nat. Board of Fire Underwriters Research Report No. 7* (1949).



Here is another example of Wyandotte Technical Service at work. In this case, the customer had been buying Soda Ash in bulk from box cars. The recommendation, based on a study of his unloading facilities and other factors, was that he switch to hopper cars. The results were a faster, cleaner unloading operation, plus a substantial saving in labor as well as material costs.

Wyandotte's skilled Technical Service staff stands ready to help you choose the proper grade of Wyandotte Soda Ash, the proper container for shipment and the best method of transportation — and to help you answer other related problems — based on your particular location, applications, storage and handling facilities.

For general product, shipping and other useful information concerning Wyandotte Soda Ash, just write:

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CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE
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Calcium Soap Deposit Removal

POLYPHOSPHATES may be used to remove calcium and magnesium soap deposits from fabrics. Tetrasodium pyrophosphate and sodium tripoly-phosphate are useful for the purpose, and also for water softening. These differ somewhat in properties, for example, in solubility, as shown in the following table:

	Solubility in 100 lbs. of water	
Temp. in °F.	*lbs. TSPP*	*lbs. Tripoly-phosphate*
50	3	14
70	4	15
160	14	22
212	21	34

These compounds also show considerable differences in their power to sequester hard-water salts, the tripolyphosphate being the more efficient of the two. For example, in water containing 3.5 grains of hardness per gallon, the respective amounts of TSPP and tripolyphosphate required to convert the calcium and magnesuim to non-precipitating form would be 0.21 per cent and 0.05 per cent at 140°F. Pyrophosphate is able to solubilize calcium compounds and to disperse magnesuim compounds, whereas tripolyphosphate solubilizes both types.

The following table gives the weight in ounces of tripolyphosphate required to treat 12 gallons of hard water containing calcium: magnesium hardness in the ratio of 2:1. The hardness is in terms of calcium carbonate.

	Amt. of tripolyphosphate required to soften 12 gallons of water, in ounces	
Hardness of water in p.p.m.	*At Room Temp.*	*At 140°F.*
50	1	1
100	1.75	1.75
200	3.25	3.0
300	6.25	4.5
400	6.25	5.25

Removal of Hard Soap Deposits

IT is difficult to recommend definite amounts of tripolyphosphate for removal of hard-soap deposits, since the content of insoluble calcium and magnesium soaps in the fabric may vary so widely. Let us assume a content of 0.5 per cent of mixed calcium magnesium soaps (2:1 ratio), for example, the stearates, which would produce harshness in most cotton fabrics in this amount. This would be equivalent to 0.15 per cent of calcium carbonate, and for 100 pounds of fabric the calcium carbonate content would be equal to that in 50 gallons of water containing 300 p.p.m. One hundred pounds of such fabric would therefore require 5x4.5 equals 22.5 ounces of tripolyphosphate. This amount should therefore be added, preferably in solution, to the first suds at 140°F, and running for at least 15 minutes. C. H. Bayley, Canadian Research Inst. Launderers and Cleaners Tech. Bull. *4*, June, 1949.

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Polyphenols as Antioxidants

The antioxidant properties of a number of polyhydroxy benzoic acids and polyphenols have been studied by the active oxygen method and baked cracker tests. By the first method, the compounds had the following ascending order of activity: Acyl phenols, polyhydroxy benzoic acid esters, phenols, and several alkyl catechols. In the cracker tests the free phenols, acyl phenols, and dihydroxy benzoic acid esters showed little or no carry-over. S. G. Morris and R. W. Riemenschneider. *J. Am. Oil Chemists' Soc. 26,* 638-40 (1949).

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Synthetic Detergents Costs

Although the basic raw material costs for synthetic detergents are much lower than those for soap, the fabrication into the desired molecular structures requires elaborate plants. Thus, raw materials averaging less than three cents per pound yield delivered alkylate at around 15 cents per pound. One pound of alkylate, in turn yields more than three pounds of built synthetic. Consequently, at present built synthetic competes on an approximate price quality with built soap products, since the degree of building effective with the synthetic is much greater than that commercially practiced with soaps.

Synthetic detergents built with 60 per cent sodium sulfate are efficient on silk and wool but not on cotton. Alkaline salts including polyphosphate builders produce satisfactory results on cotton and in general heavy duty laundry work. Carboxymethylcellulose is being used to a greater extent in heavy-duty synthetic formulations.

Liquid non-ionics have shown a satisfactory performance in dishwashing, and prices are comparable to the unbuilt anionic agents. Low-foaming detergents are used in automatic home washing machines and in automatic dishwashing machines; the cation-active agents continue to be important as germicidal agents. F. D. Snell, *Chem. & Eng. News 28,* No. 1, 29-30, (1950).

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Soap Solution Hydrolysis

The hydrolysis of soap solutions is discussed, based on the assumption that mixed micelle formation occurs between fatty acid molecules formed by hydrolysis, and soap ions. At the critical concentration for soap micelles as normally determined, the ratio of soap ions to fatty acid molecules is not far from one. The dissociation constants of the higher fatty acids depend on the variation of this ratio with total soap concentration.

The effect of butyl alcohol on the hydrolysis curve of sodium oleate at 25°C. is estimated in a semiquantitative manner, on the basis of a simple competition between fatty acid and alcohol molecules for the limited number of sites in the micelle. G. Stainsby and A. E. Alexander, Trans. Faraday Soc. *45*, 585-97 (1949); through *Chem. Abs.*

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Detergent Gels

The metallic salts of the sulfuric acid esters of primary, secondary and tertiary alcohols having eight to 20 carbons have a tendency to gel at low temperatures. The addition of ammonium sulfanate (Brit. Pat. 496,-209) acts to counteract this tendency, however, the same effect may be produced by adding .05 to .5 gram mols per mol of detergent of cheaper salts such as the ammonium sulfates, chlorides, thiocyanates, nitrates, phosphates, citrates, carbonates or carbamates, a substituted ammonium or magnesium. Dutch Pat. 64,014.

What goes on here?

● Here is a typical stearic acid filtration operation.

But . . . that's only part of the story. Not only is the acid being filtered, but as it circulates it is being continuously inspected for excess cloudiness.

That instrument you see partly hidden below the filter press is a Purifil. The acid is by-passed from the process line and flows continuously through the inspection chamber of this unit. The dial on the Purifil is set to a predetermined acceptance point which may be interpreted in parts per million. When this acceptance point is exceeded an alarm sounds instantly notifying the operator that a cloth is leaking or a break has occurred.

Result . . . accurate, dependable quality throughout the entire filtering operation. Guesswork is eliminated. Valuable man-hours are saved. No more sampling and laboratory testing . . . no more assuming that equipment is functioning properly. The Purifil will detect suspended solids in concentrations as low as one-half part per million. And, if desired, it will operate a remote indicator, recording meter, proportional controller, or cut-off valve.

This illustrates just one of the many practical applications of the Purifil in the processing of edible fats, fatty acids, soaps, detergents, cosmetics, dyes, oils, and dozens of other products. In actual operation it has fully demonstrated its amazing accuracy, dependability and ability to materially reduce operating costs.

No doubt there are applications in your processing where accurate detection of cloudiness might prove advantageous. So . . . why not get the facts about the Purifil . . . today. There's no obligation.

DETECTS suspended solids in liquids or gases in concentrations of less than one part per million.

SIGNALS when a predetermined acceptance point is exceeded.

DIVERTS. Will actuate a valve to divert flow until acceptance point is regained.

RECORDS. Will actuate a recording device to indicate variations in the amount of solids in suspension.

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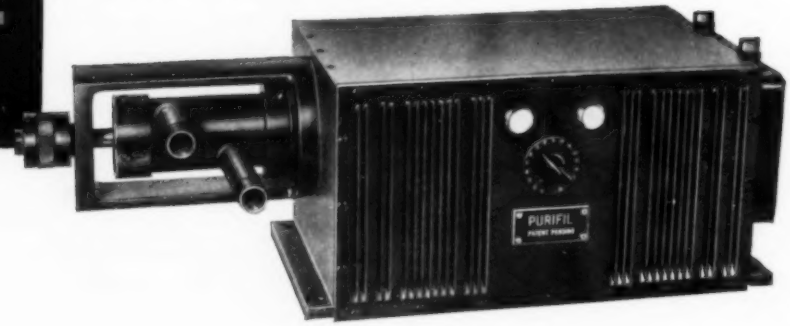

Soap Solution Properties

Solutions of 30 commercial soaps and of six synthetic detergents were studied as to the effect of concentration on surface tension, electric conductance, pH, opacity, and foaming power. Solutions of toilet soaps have surface-tension minima at concentrations of 0.1-0.2 per cent, and 2.5 per cent. Coco, glycerine, washing, and shaving soaps show a single sharp minimum at 0.2-0.3 per cent. The surface tension of solutions of synthetic detergents decreases with concentration up to 1.25 per cent, beyond which a constant value is reached.

The conductance of solutions of commercial soaps increases rapidly with concentration up to 0.25 per cent, and then decreases until a concentration of 2.5 per cent is reached. Solutions of synthetic detergents have very high conductance values at low concentrations, decreasing at 0.5 per cent, increasing up to two per cent, and slowly decreasing with higher concentrations.

The pH of 2.5 per cent solutions of commercial soaps averages about ten, while the pH of 2.5 per cent solutions of synthetic detergents varies from five to ten, depending on the type, etc. Most solutions of the soaps are transparent when dilute, and show increasing opacity with increasing concentration. Glycerine and coco soaps, however, show transparency up to high concentrations. Solutions of synthetics are transparent at both high and low concentrations. The rate of growth of foam of solutions of both soaps and synthetics remains relatively unchanged as the concentration is increased. G. S. Hattiangdi, W. W. Walton, and J. I. Hoffman, *J. Research Natl. Bur. Standards 42*, 361-8 (1949).

Dispersion Study

An improved technique for measuring dispersing power of detergent solutions is to agitate lightly oiled umber soil with the detergent solution. This is permitted to stand in a Nessler tube for two hours. A sample of the suspension is pipetted off and the turbidity determined in a modified electric turbidimeter. The results are expressed as 100 times the reciprocal of the length needed to just obscure the light filament. F. D. Snell and I. Reich, *J. Soc. Chem. Ind.* (London) *68*, 98-100 (1949).

Perfumes Harmful in Soap

Discoloration of soap caused by the perfume ingredients is due partly to the natural alkalinity of the soap. Traces of alkali promote atmospheric oxidation of some of the less stable perfume ingredients, and dark colored products may be formed. Although aldehydes include some of the most valuable perfume materials, they may also be troublemakers. Those aldehydes which have one or two free hydrogen atoms on the alpha carbon atom tend to undergo the aldol condensation in the presence of alkali. Among the ingredients which should be avoided or used very sparingly in perfumes intended for white soap are the following: phenyl acetaldehyde, cinnamic aldehyde, hydrocinnamic aldehyde, vanillin, heliotropin, eugenol, isoeugenol, coumarin, methyl anthranilate, and some synthetic musks. R. J. Huttleston, *Soap, Perfumery, Cosmetics 22*, 993-4 (1949).

New Penetration Method

A method has been devised to give an indication of the comparative wetting and penetrating qualities of surface-active agents. A definite volume of surface-active agent solution is added to the most porous of a series of five stainless steel filtering crucibles with porous, sintered, stainless steel filter elements of varying porosities. A record is made of the time in seconds required to deliver the first drop and the first milliliter of solution. Based on the time for delivery under each category, a rating is given, and the comparative wetting and penetration of each surface-active agent studied are evaluated. The same method can be applied for copper, bronze, medium steel, glass, canvas, cloth, and other textile materials. This technique can also be used in research on metal cleaning problems. A. J. Finks and N. J. Petito, *Anal. Chem. 21*, 1101-2 (1949).

Soap versus Synthetics

The principal types of synthetic detergents are discussed as to composition and method of manufacture. An outstanding difference in performance between soap and synthetics is shown by measurement of dispersing power, using oiled umber as the material to be dispersed. At a concentration of 0.2 per cent, the dispersing powers measured were as follows:

Detergent	*Dispersing Power*
Tallow-coconut oil soap flakes	91
Sodium alkyl aryl sulfonate	9
Sodium alkyl sulfate	7

The greater dispersing power of soap can be interpreted as ability to deflocculate and suspend soil, to prevent its redeposition.

Increase in the use of synthetics is not likely to diminish the soap market radically in the foreseeable future. The present trend is to supplement our normal supply of soap with synthetics and to accompany that with the development of more and more applications for all kinds of surface-active agents. Synthetic detergents themselves are being studied with a view to bringing their general cleansing ability up to that of soap in soft water. This apparently can be done by special building with molecularly dehydrated phosphates and carboxy methyl cellulose. Combinations of anion-active agents with nonionics also show greater detergent ability than either one alone. This synergistic effect leads to useful combinations. F. D. Snell, *J. Am. Oil Chemists' Soc. 26*, 338-41 (1949).

Antioxidant for Animal Fats

Butylated hydroxyanisole has been developed as a new and very effective antioxidant for animal fats. It is readily soluble in fats, and practically insoluble in water. It exhibits synergism with acids, hydroquinone, methionine, lecithin, and thiodipropionic acid. Extensive pilot plant and commercial tests have demonstrated the practical usefulness of the antioxidant. H. R. Kraybill, L. R. Dugan, Jr., B. W. Beadle, F. C. Vibrans, V. Swatrz, and H. Rezabek, *J. Am. Oil Chemists' Soc. 26*, 449-53 (1949).

DRYMET *

THE ECONOMICAL DETERGENT SILICATE

Cowles DRYMET, anhydrous sodium metasilicate, is the most highly concentrated form of sodium metasilicate available. It is more economical to use, on the basis of both Na_2O (alkalinity) and SiO_2 (silicate) than any other type of hydrated or anhydrous detergent silicate, either compounded or by itself. DRYMET contains no water of crystallization.

DRYSEQ *

THE ALL-PURPOSE DETERGENT SILICATE

Cowles DRYSEQ, anhydrous sodium sesquisilicate, is a medium pH alkaline cleaner which will do fast, dependable work at a low cost to the user. It is a white, free-flowing powder, quickly and completely soluble in hot or cold water—containing 56.75% Na_2O—making it an economical base material for compounding.

Cowles CHEMICALS

DRYORTH *

THE HEAVY-DUTY DETERGENT SILICATE

Cowles DRYORTH, anhydrous sodium orthosilicate, is a powerful, speedy, heavy-duty cleaner with valuable penetrating and wetting-out properties, reinforced dirt-removing power and unusual emulsifying action. It is an anhydrous, free-flowing powdered silicate containing not less than 60% Na_2O, which may also be used as an economical constituent of high pH cleaning compounds.

CRYSTAMET *

THE MEDIUM pH DETERGENT SILICATE

Cowles CRYSTAMET is a pure, perfectly white, free-flowing granular pentahydrate sodium metasilicate with the normal 42% water of crystallization. Suggested for compounding when it is desirable to lower the concentration of a finished product. Readily soluble—chemically stable—easy to handle. Can be used on medium pH jobs.

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U.S.I. CHEMICAL NEWS

March ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1950

Canned Foods Improved By Use of Antibiotics

Lower canning costs and tastier canned foods may result from recent work on a new method using antibiotics in food preservation, according to a group of research scientists. In their tests, canned vegetables were sterilized by the addition of very small amounts of an antibiotic and then mild heat treatment of the sealed cans. The new procedure is said to have been as effective in destroying bacteria and other food-spoiling organisms as ordinary canning methods, which require more severe cooking.

Process Still Experimental

The process is still experimental, the scientists point out, and whether the antibiotics as used are toxic to man can only be determined after long and careful investigation. Tests made to date with the antibiotic "subtilin" are reported to indicate it has no ill effects on animal life. Compared with ordinary canning, the new method permits sterilizing the cans with heat faster, at lower temperatures, and without expensive pressure-cooking equipment. The antibiotics used reportedly do not affect the food's taste, and since only a mild heat treatment is needed the final products are described as having a better flavor than vegetables canned by conventional methods.

New Drug May Help Reduce Heart Fatality Rate

A new drug, claimed to be the best medicine yet developed for preventing blood clots which kill 200,000 Americans each year, may cut down heart attacks and save over 70,000 lives a year, according to a noted medical researcher. Tests indicate that the drug, "Tromexan," is better than any of the drugs now used against coronary thrombosis.

Tromexan goes to work within 24 hours and practically stops thinning the blood 24 hours later. This is an advantage, explained the researcher, since in some cases, for example in patients who also suffer from ulcers, blood cannot be thinned for too long without risking hemorrhages. Dicumarol, the leading weapon now in use against blood clotting, has the disadvantage of not going to work for two to four days and of continuing to thin the blood for four to five days or more. Heparin, which has also been used for blood thinning, is expensive to produce.

Bonds Aluminum to Steel To Prevent Corrosion

Bonding of aluminum to steel by a newly patented process is expected to find wide usage for protecting steel against corrosion. In the new method two strips of aluminum foil are applied to the top and bottom of steel sheet. A fine iron coating is first applied to the steel by an electrolytic process to provide a permanent bond between the two metallic surfaces. Older methods involving dipping steel in molten aluminum failed to produce a satisfactory bond. After the aluminum foil has been bonded to the steel by high-pressure rolling, the aluminum-covered steel can then be further rolled, it is reported, to reduce its thickness as desired.

U.S.I. Acquires Foreign Rights To 'Synthetic Pyrethrum' Patents

Issuance of Foreign Patents Will Permit U.S.I. to License Manufacturers Abroad to Produce New Pyrethrin-Like Chemicals

The acquisition by U. S. Industrial Chemicals, Inc., of important foreign rights under pending United States patents covering the synthesis and manufacture of pyrethrin-like chemicals was announced recently by Wm. P. Marsh, Jr., president.

Corresponding applications have been filed in all major foreign countries, including the United Kingdom, France, Australia, India, Brazil, Sweden, Pakistan, South Africa and many others, Mr. Marsh said.

In March of last year the insecticide world was electrified by the announcement of the U. S. Department of Agriculture that Milton S. Schechter and F. B. LaForge had successfully synthesized a group of chemicals closely corresponding to one of the important constituents of natural pyrethrum, and possessing many of the unique advantages of the natural product.

U. S. patents covering the invention were filed by the Department of Agriculture and

MORE

HE LOOKS TOUGH — and he is! The horse fly is one of the hardest to kill of the insects that attack dairy cattle. But dairy farmers can now control this and many other insects with *U.S.I. Pyrenones—safe, effective insecticide ingredients containing pyrethrins and piperonyl butoxide.

* Reg. U.S. Pat. Off.

New Chart, Booklet On Transparent Films

A newly compiled chart, reported to present for the first time in easy-reference form the comparative characteristics of commonly-used transparent films, is being offered to film users by a well known adhesives manufacturer. Films in general use have been set up in the chart in 14 groups, it is stated, according to basic chemical composition. In addition to identification by their physical or chemical reactions and by their manufacturers, the films are further described as to their respective trade names, their gauge or thickness, commercial types according to the manufacturer's code description as well as their characteristics in actual use. More than 38 different trade names of transparent films are listed; names and addresses of the manufacturers of these products are also given. Supplementing the chart is a pocket-size booklet on how to handle adhesives for transparent films. This booklet discusses further details about general types of adhesive formulations for bonding transparent films, proper handling methods, and some of the problems encountered in obtaining good adhesion.

Natural Rubber Improves Durability of Leather

By impregnating leather with natural rubber scientists report they have been able to increase abrasion- and water-resistance so that sub-standard leather, such as "bellycuts" from steer hides, may be used commercially. Preliminary service testing of rubber-treated soles indicates a definite improvement in wear over untreated leather soles. Investigations are now under way on the use of synthetic rubber and other materials for leather treating.

New Synthetic Mica Superior to Natural

Synthetic mica said to have essentially the same properties as natural mica but to be superior to it in ability to withstand high temperature has reportedly been produced. The new synthetic product is made from quartz, agnesite, bauxite, and a fluorosilicate which acts as a crystallizing agent and imparts to the material its superior heat resistance.

New High-Vacuum Drier

A new, continuous, high-vacuum belt drier, said to be economical for drying such materials as penicillin, amino acids, milk, and coffee, has been developed. Used to produce a soluble "instant" coffee the new drier has yielded material that is of low density, porous and instantly soluble.

Advantages claimed for the new unit are that the drier area is always producing and that it has a relatively high capacity. Heat input can be controlled, it is reported, along the belt to maintain a temperature gradient, which is important in attaining maximum production. One man can operate a large unit, so labor cost is low. Controlling concentration of solution to be dried and amount sprayed on a unit area of belt is said to make possible the production of almost any desired density of material.

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CONTINUED 'Synthetic Pyrethrum'

it was announced that these patents would be held in the public interest for unrestricted use in this country. The prosecution of foreign patents, however, was waived to the inventors as individuals, subject only to certain rights reserved by the federal government, and U. S. Industrial Chemicals acquired these foreign rights from Mr. Schechter and Dr. LaForge for an undisclosed sum.

The chemicals are destined for use in insecticides, which long have effectively utilized natural pyrethrins, obtained from the pyrethrum flower. Pyrethrum, while recognized as a uniquely valuable insecticide, has always been limited in supply and inherently expensive to raise, and the problem of synthesizing the material had defied chemists until 1949.

Spotted cucumber beetles on the blossom of a cucumber plant. These and a wide variety of other truck crop insects are controlled by dusts and sprays based on U.S.I.'s CPR — an insecticide concentrate containing pyrethrins, piperonyl cyclonene, and rotenone.

Issuance of the foreign patents will enable U.S.I. to license qualified manufacturers abroad to produce these chemicals according to manufacturing specifications provided by the corporation. It was pointed out that foreign production of the chemicals will necessarily depend on development of adequate markets and the availability of raw materials.

In this country developments have been rapid and U. S. Industrial Chemicals, one of several concerns carrying on work on the synthesis, recently announced the imminent availability of one of the Schechter-LaForge group of chemicals which almost exactly duplicates Cinerin I, one of the active principles of pyrethrum. Its availability supplements the present limited supplies of natural pyrethrum, and facilitates the current rapid expansion in the use of pyrethrum-type insecticides, although the synthetic compound cannot be regarded as a substitute for natural pyrethrum for many uses. Most of the natural pyrethrum is now imported from Africa.

The company now uses a large proportion of the world's supply of pyrethrum in combination with piperonyl butoxide and piperonyl cyclonene and other chemicals in the production of insecticide materials that have been demonstrated to be highly effective as well as free from any toxicological hazards.

New Guide for Preparing Warning Labels Is Offered

A revised edition of the manual, "Warning Labels," originally published in 1945, is available now from a noted chemical association. Arranged in convenient 6"x9" size, loose leaf, the 86-page manual is intended as a guide for the preparation of warning labels for hazardous chemicals. It is divided into three parts: general principles involved in the design and preparation of warning labels for hazardous chemicals; 180 illustrative warning labels for industrial chemicals; 58 illustrative warning labels for economic poisons. The book has a table outlining statements of hazard, precautionary measures and instructions in case of contact or exposure, based on class of hazard encountered.

Analyze 'APC' Without Separating Components

A new method involving infra-red analysis is claimed to make possible simultaneous determination of aspirin, phenacetin, and caffeine without separation of the components. The procedure is accurate to within a range of ±2% and can be completed in about four hours, according to the scientists who developed it.

TECHNICAL DEVELOPMENTS

Further information regarding the manufacturers of these items may be obtained by writing U.S.I.

A new "water-hating" (hydrophobic) starch product, claimed to have broad commercial possibilities for use as a flatting agent in lacquers, detackifying agent for rubber articles, lubricating agent, etc., is a finely divided powder so free-flowing that it behaves in many ways like a liquid. **(No. 549)**

A wall-covering material with a fabric pattern that looks like a textured surface but is actually hard and smooth to the touch has been developed, it is reported. Application is by adhesives or mechanical fastenings and it can be worked with ordinary tools, the makers assert. **(No. 550)**

A new, improved crack-sealer for factory, home, and farm use in sealing windows, baseboards, holes, etc. against cold, dust, dirt, and insects, is applied simply by pressing into place by hand, according to the manufacturers. It can be applied, removed for window cleaning, and re-applied again and again, it is claimed. **(No. 551)**

A new "anti-itch" drug reportedly offers relief from severe itching. **(No. 552)**

A new-type extension spray gun for industrial maintenance painting, capable of reaching to second-story levels, is claimed to be light in weight and to accommodate any sprayable fluid from light paints to heavy asphaltic compounds. **(No. 553)**

A low-pressure aerosol for applying aluminum paint, suitable for spraying radiators, pipes, furnaces, and other metal, wood, or stone surfaces is on the market. One can covers 75-100 sq. ft., depending upon the surface, the makers claim. **(No. 554)**

A new agricultural fungicide, described as exceptionally effective against a wide variety of fungus diseases attacking fruits, vegetable crops, and certain plants, is reported available as a white odorless, tasteless powder. **(No. 555)**

A microscope the size of a fountain pen, said to have relatively high-power magnification—up to 60 power—is described as being a precision-built instrument that is light in weight, ruggedly constructed, and self-illuminating. **(No. 556)**

A dual purpose lacquer for use on both cellulose acetate and cellulose acetatebutyrate plastics is reported to be available in a clear finish or in colors, and to air dry in a few minutes. **(No. 557)**

A new-type "metallic-finish" upholstery material is described as resistant to aging, weathering, and sun exposure. **(No. 558)**

PRODUCTION CLINIC

By E. G. THOMSSEN, Ph.D.

THE shelf life of soaps, liquid waxes, disinfectants and other chemical specialties is a matter of concern to control chemists. It is most discouraging when an item becomes defective, especially after it reaches the customer's hands. Customer ill will, reduced sales, lack of confidence or hesitancy to produce more goods and angry recriminations between sales and production departments all result from product deterioration. Product defects often appear under conditions in which they are least expected, and frequently for no good reason whatsoever. At times the off-goods are returned with a complaint. What is worse is the situation in which defective goods are delivered to a resentful user who does not return them but concludes he has been imposed upon or has been "gypped." Such a person is very apt to broadcast his resentment by word of mouth to competitors, friends and acquaintances, who in turn further spread the story. The harm done to a business by the distribution of spoiled or defective products is difficult to estimate. We have seen cases in which years of effort to gain wider consumer acceptance of an item has received a serious setback by distribution of one large defective batch of a product.

Instructive comments regarding defects in various products under consideration are helpful. These items include powders, clear and emulsion liquids, pastes and compact solids.

Imperfections of a product may be caused not only by physical and chemical changes but by misuse or misunderstanding of directions for use. Physical flaws are caused by such atmospheric conditions as changes in temperature, humidity or light, especially direct sunlight. Chemical changes may be wrought by incompatibilities, oxidation impurities, wrong compounding procedure, erroneous chemical analysis, lack of chemical control, and bacterial or fungicidal action. Physical spoilages include

DR. THOMSSEN

separation, hardening, grittiness, cloudiness, shrinkage and consistency changes. Chemical defects, usually more serious, are characterized by off odor, darkening, spotting, liquefication, deleterious effect during use, decomposition with loss of active ingredients, etc.

To focus our attention more sharply upon specific defects, it is helpful to consider the products under the forms in which they are marketed, i.e., as solids, liquids, emulsions or pastes.

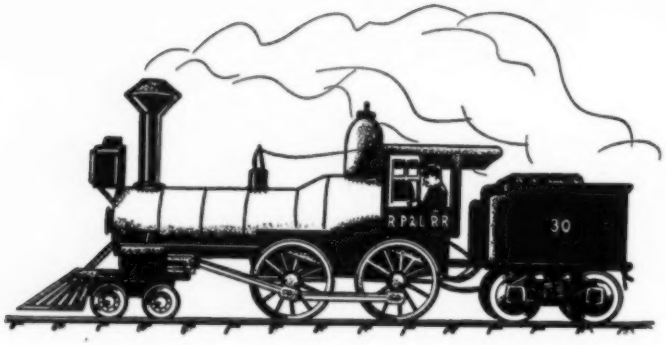
Solids may come either in powder form or as one single unit. Powders are not very prone to defects. Some of the imperfections that appear from time to time are caking, grittiness, non-uniformity of color, darkening or bleaching of color and loss of active ingredients. The correction of such faults requires careful determination of their causes. Trial and error tests of ingredients in compounding, analysis of the raw materials to ascertain their purity, check up of equipment used for grinding and mixing and investigation as to storage surroundings, especially as to humidity of air, are helpful in correcting powder defects.

Since caking is quite common, it is important to look for changes in moisture content. This may either be reduced or increased. If water, especially water of crystallization is lost, the storage atmosphere may be too hot or too dry. If water is gained, then the humidity of the storage space is too high. Compact solids tend to crack and crumble. Frequently these conditions are caused by temperature changes. Especially is this true if a product has been stored in a damp place and frozen.

Other difficulties encountered in cake or powder form products may be chemical reaction due to deterioration of ingredients, especially the binding agent, or mechanical failures such as incorrect or uneven pressure during compression. If a compact solid is tabletted, the material must be granulated correctly before compression to avoid difficulties.

In manufacturing liquid products, it is desirable to obtain a sparkling clear preparation. Such liquids are very apt to cloud, form sedimentation or develop an unsightly floater. Liquids should be clarified by filtration. Correct aging, filtering at reduced temperatures, using a chelating agent, lessening the amount of solute, using non-corroding equipment and packages, and preventing contamination during processing from surrounding atmosphere are all necessary to produce a satisfactory clear liquid. Too frequently overlooking the simplest of details proves to be the difference between a cloudy and clear liquid.

Emulsions can be a source of trouble. Their breaking or separation is most often caused by incorrect manipulations during manufacture. Thickening of liquid emulsions with age is a common defect frequently resulting from using too much of a wax, fatty acid or hydrocarbon with high melting points. Purity of raw materials, elimination of metals, etc., from hard water, use of efficient emulsifying equipment, correct and uniform temperature control, control of



Since the Days of the "Iron Horse"...

CHECK YOUR NEEDS FROM THIS LIST

VEGETABLE OILS

Babassu, Castor, Cocoanut, Corn, Cottonseed, Olive, Palm, Peanut, Sesame, Soybean

ANIMAL FATS

Sperm Oil, Oleo Stearine, Lard, Grease, Tallow, Lanolin, Neatsfoot Oil

FATTY ACIDS
MINERAL OILS
PETROLATUM
ALKALIES
and other chemicals
STARCH and SOURS
SILICATE OF SODA "METSO"*
**Reg. U.S. Pat. Off., Phila. Quartz Co.*

QUADRAFOS
granular and beads. A stable polyphophate for water conditioning and mild but effective detergency.

AIR DRYETTES
CALCIUM CHLORIDE

THE MAYPONS
Unique surface active agents; prolific foam; high detergency and emulsifying powers: suitable for cosmetic and industrial use.

Soapers have depended on WH&C ...for Raw Materials of Quality

SINCE 1838, we've been supplying the nation's "soapers" with basic raw materials—everything from Acid oils and Adeps Lanae to Waxes and Wetting agents.

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pH, quick cooling, selection of the right emulsifying agents, the use of a colloid mill or a homogenizer, storage under carefully controlled conditions of temperature and atmosphere, are some of the requisites for avoiding later difficulties in the making of emulsions.

Products in paste form are packaged in tubes, cans, jars and pails. Corrosion of packages made of metal is common. It is brought about by chemical reaction and can be avoided by correct package testing. At times, defects in the package itself are found, such as pin holes in collapsible tubes. Careful investigation under accelerated laboratory conditions, especially at the lower and higher temperature ranges, should be undertaken before deciding definitely upon a package.

Certain pastes are prone to separation of liquid. Curdling and hardening also are quite common as pastes age. Liquid separation is most often caused by an insufficient quantity or the incorrect use of the binder. A binder is a colloidal product such as starch, various gums, sea mosses, gelatine or methyl cellulose. It is necessary to employ these under the correct conditions to maintain a paste that withstands age, temperature extremes and humidity changes.

Hardening and curdling are brought about by the liquids in a paste being "over absorbed," that is, by the solids being tied up in the product in such a manner as to lose their ability to soften. Slow chemical changes also cause hardening.

Certain paste soaps are usually more uniform if they contain a percentage of free fatty acids. Since pastes tend to spoil easily, it is advisable to maintain constant chemical control of finished product, as well as to evaluate carefully the raw materials used.

While actual imperfections, some of which we have just considered cause complaints, misuse of the product is also troublesome. Consumers are careless and lazy when it comes to reading directions. For that reason, use instructions should be terse, accurate and simple in language. Illustrations are very helpful. It is a good policy to have directions for a new product studied and examined by a relatively large group of people before adopting them. In this way details are uncovered by the uninitiated which may have been overlooked by the person writing the directions because of familiarity with the product. Quite commonly a good product loses caste because of improper stating of directions for use.

All products of the kind we are considering are offered under stiff competition. Even the simplest of formulas under which they are made may at times go wrong, due to some minutiae. Eternal vigilance and careful control methods will go far toward keeping products high in quality and satisfactory to the consumer.

Small Sized Pulverizer

VERY often it is desirable to grind small quantities of a product in the laboratory. A mill that grinds laboratory samples quietly to 150 mesh by a single operation is offered by Mine & Smelter Supply Co., New York. Grease will not contaminate any samples in this pulverizer, which is driven by a two H.P. motor. The mill contains no gears to cause vibration and is easily adjustable.

Bladeless Centrifugal Pump

A CENTRIFUGAL pump having no blades and which does not clog when such substances as rags, paper, fiber and other trash get into it is offered by Fairbanks, Morse & Company. Instead of pumping with the usual rotating vanes, a single rotating helical tube does the work. This arrangement permits wider openings through which solid objects may pass readily. As the helical tube rotates in the liquid, the fluid enters at the center or small radius of the corkscrew-like arrangement. The centrifugal force drives it against the sides of the helical tube and emits the liquid at the periphery. Besides handling about everything that passes through the inlet, a smaller size pump takes care of the volume of a larger blade or vane type centrifugal pump and requires less horsepower.

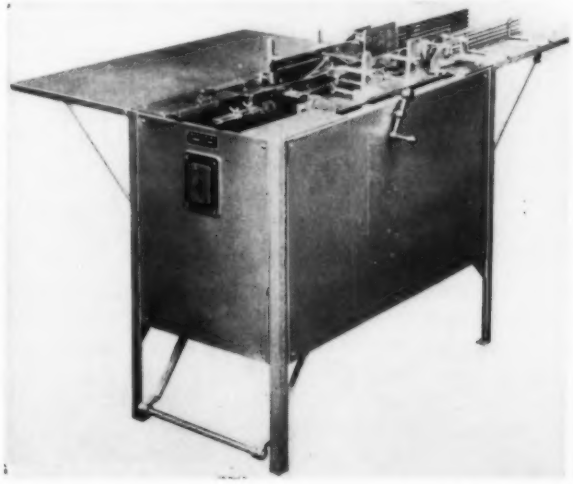
Handy Adhesive

ARMSTRONG PRODUCTS CO. of Burket, Ind., is offering an adhesive in sizes from pints to gallon. The material fastens metal, glass, ceramics, plastics and wood. It is a thermosetting compound that contains no volatile solvent and does not shrink or swell with age. Moisture resistant, it sets with mere contact pressure.

—— ♦ ——

New Knapp Wrapper

The addition of Model EZA to its line of wrapping machines was announced recently by Knapp Manufacturing Co., Los Angeles. The new unit wraps items up to 3½x12x8 inches in standard envelope type fold, at speeds up to 20 per minute, and may be adapted for wax paper, cellophane or heat-sealing foil wraps. It occupies 20x40 inches of floor space; the working surface is 32 inches above the floor, with standard collapsible working table and discharge conveyor table.



The new Model EZA wrapping machine of Knapp Manufacturing Co., Los Angeles, features fast change over to different size wrap. Gears and chains are all standard stock items obtainable at local hardware stores.

New Tube Filling Machine

A new and improved filling and closing machine for aluminum tubes with materials as light as S.A.E. No. 10 oil was announced recently by Perl Machine Manufacturing Co., Brooklyn. The machine, designated "Model 706," is fully automatic, requiring the attention of only one unskilled operator to place the tubes in the holders before filling. Thereafter the tubes are filled, closed and ejected entirely automatically. All parts coming in contact with the solution are made of stainless steel. Speeds on regular production exceed 40 per minute on 1⅛ inch tubes and 30 per minute on 1½ inch tubes.

H & D Packaging Catalog

A catalog-type booklet descriptive of various standard and specialty boxes used for packaging and shipping virtually every kind of product was announced recently by Hinde & Dauch Paper Co., Sandusky, O. The new 32-page booklet, entitled "How to Pack It," outlines the specific uses for some 76 different types of corrugated boxes, pointing out the construction features of each.

Tall Oil in Soap Folder

"Tall Oil in Soap Products," the sixth in a series of bulletins on applications of tall oil, was issued recently by the Tall Oil Association, 122 E. 42nd St. Figures on consumption of tall oil fatty acids in soap are given, and their use in various types of soap products are listed.

Bulletin on "Emcol H-77"

Technical bulletin No. 29, describing "Emcol H-77," a new emulsifier for DDT, toxaphene, chlordane, benzene hexachloride, methoxychlor, aldrin, dieldrin, 2,4-D or 2,4,5-T esters and certain combinations of these toxicants, is now available upon request from Emulsol Corp., Chicago.

Full Screw Capper Output

Resumption of full production on its "Whirlwind Screw Capper, Model 'A'," suspension spring type was announced recently by Scientific Filter Co., New York. The unit, is small and compact, and will handle screw caps of every type, molded or

metallic, or any type or shape of container whether made from glass or tin. It is equipped with a built-in specially designed Universal current motor. Normal output is approximately 30 to 60 capped containers per minute.

New Chemical Who's Who

Leading firms in the chemical and allied industries have been invited to submit nominations from their personnel for inclusion in the forthcoming third edition of the "Chemical Who's Who" to Williams Haynes, 161-163 Water Street, Stonington, Conn., the editor. This standard reference work lists the executive, administrative, sales, and technical leaders in the chemical field, as well as professors of chemistry and chemical engineering in colleges and universities, leading consultants and directors of chemical research. It was established by Mr. Haynes in 1925 and will hereafter be published by the Lewis Historical Publishing Co., New York, under the editorship of Mr. Haynes and Dr. Winfield Scott Downs, the editor of "Who's Who in Engineering," also published by the Lewis house. Questionnaires to the list of chemical leaders in all fields will be mailed shortly and publication of the 1950 edition is planned for the autumn.

New Gen. Aniline Dyes

A new line of fluorescent dyes or "brighteners" for washing compounds is now being manufactured by General Aniline & Film Corp., New York, it was announced recently. The new dyes are being sold for use in soaps, synthetic detergents and in certain finishes.

Water Hardness Booklet

An 18-page booklet dealing with the hardness of water in 14 counties near Philadelphia was issued recently by the Philadelphia Inquirer. It contains detailed data on all public water supplies within the 14 counties and covering Philadelphia, Bucks, Chester, Delaware and Montgomery counties in Pennsylvania; Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Mercer and Salem counties in New Jersey, and New Castle County in Delaware. Tests were obtained by standard methods prepared and approved by the American Public Health Association and the American Water Works Association. The booklet is illustrated with 10 maps.

Approve Glycerin Spec.

Federal Specification No. O-G-491—(amendment-2) glycerine (glycerol) has been approved for the use of all federal agencies, according to a recent announcement of the General Services Administration. The specification goes into effect March 30, 1950.

Exact Weight Scale Folder

A folder on its automatic electronic check-weigher was issued recently by Exact Weight Scale Co., Columbus, O. The scale is designed for high speed operation, handling up to 90 packages per minute. It also is equipped with an electronic means of classification which requires no synchronization with the feeder conveyor.

New Stuyvesant Conveyor

Stuyvesant Engineering Co., Lyndhurst, N. J., recently issued a circular on its newest development in packaging equipment: an inexpensive automatic belt conveyor attachment for use with its "Fillmaster" dry and semi-dry filler.

PRODUCTS AND PROCESSES

Transparent Soaps

The choice of fatty acids is one of the main factors in producing good transparent soaps. It is generally recognized that unsaturated fatty acids are converted more easily to transparent soaps than saturated acids containing the same number of carbon atoms. Equal amounts of tallow and rosin produce a soap sample having a high degree of transparency. Castor oil is also an aid to good transparency within certain limits. An excess will cause sweating and scanty lather. Excessive rosin is undesirable, as it also causes sweating and stickiness, while white incrustrations may be due to an excess of caustic or sugar. Too much glycerine may cause tackiness. Important factors to observe in manufacturing include use of clean fats and oils and caustic lye, sugar and lye solutions, that are as clear as possible. M. A. Laboor, M. R. Dutta, *Indian Soap Jour. 15*, No. 3 83-87 (1949).

Optical Bleach Precautions

The hydroxymethyl coumarin, B methylumbelliferone, used in optical bleaching should be used with certain precautions, because of several undesirable tendencies. These include: (1) degradation by strongly alkaline solutions with loss of fluorescence, (2) formation of complexes with strong mineral and some organic acids, and (3) degradation by chlorine gas. The coumarin has been used satisfactorily in solvents such as ethylene hydroxide, isopropanol, or acetone, as these solutions have high fluorescence. *Textile Recorder 67*, No. 801 68 (1949), through *Chem. Abs.*

Soapmaking Process

"Improvements in or Relating to Method of Soap Making and the Product Resulting Therefrom." Cargill Inc., U. S. A. provides a new process of making soap by reacting alkalis at a temperature from 20°-100° C. with synthetic fatty acids manufactured from paraffinic hydrocarbons. Such saponified synthetic fatty acids can also be used in the preparation of other detergents, etc. Brit. Pat. 628,-457/458, through *Soap, Perf. & Cos.* 23, No. 1, 59 (1950).

Superfatting Toilet Soap

Superfatting agents for toilet soap should be neutral, inert to alkalis, unchanged by air and water, and have an emollient effect on the skin. The best suited agent for this purpose is lanolin; however, its price is generally high, it has a characteristic odor, and it decreases the lathering power of the soap in concentrations above five per cent. Other agents which have been used are mineral oils, and fatty acid esters such as diethylene glycol ricinoleate and diethylene glycol stearate. The latter group do not interfere with lathering power of soap. Other superfatting agents include borax, lecithin, and certain fatty alcohols such as cetyl alcohol. *Seifen, Ole, Fette, Wachse 75*, 173-6 (1949).

Fatty Acid Distillation

For the laboratory distillation of fatty acids at four mm. of mercury pressure, the bubble-cap column was more satisfactory than the packed column containing fibrous glass since the pressure drop per theoretical plate was about one-fifth as great at comparable capacities. The comparison should be even more favorable to the bubble-cap column with larger sizes. F. C. Williams and J. O. Osburn. *J. Am. Oil Chemists' Soc. 26*, 663-8 (1949).

Tests on Soap Wraps

Twenty wrappers and cartons of well known brands of foreign soaps were tested for fading, bleeding, effect on paper, discoloration, and transfer of color by the following methods: (1) T.A.P.P.I. Extraction Method, (2) Alkali Spot Test, (3) 2.5% Soap Solution Test, (4) Soap Contact Test, and (5) Alkali-soap Solution Test. Most of the wrappers and cartons failed in tests 2, 3, 4 and 5. However, these same wrappers were found in good condition when purchased on the market. Commercial soaps are usually protected with inner linings, consequently, a series of modified tests on the same wrappers were made, taking into account inner wrappings. Tabular data on both series of tests indicated a better agreement with shelf storage performance in the case of the modified tests. B. L. Rao et al. *Indian Soap J. 15*, 43-59, Aug.)1949).

Toilet Bowl Cleaners

The modern use of nitre cake primarily sodium bisulfate or acid sulfate) in lavatory bowl cleaners has proved very satisfactory. The bisulfate has pronounced caking tendencies, however this can be overcome by the use of about one per cent kerosene or pine oil. These additives serve also to prevent corrosion of metal containers. The usual alkaline fillers cannot be used to dilute acid sulfate because of the strong resulting reaction with evolution of chlorine; however, sodium chloride and sodium sulfate have proved satisfactory in this capacity. In water sodium bisulfate forms strongly acid solutions, which have been used as disinfectants; sodium acid sulfate has good scale removing properties and desirable disinfecting action. A typical toilet bowl cleaner is composed of 98 parts sodium acid sulfate, one part kerosene and one part steam-distilled oil. J. M. Vallance, *Manuf. Chem. 20*, No. 12, 592 (1949).

Wool is passed continuously through a bath of aqueous scouring solution consisting of soda ash, sodium bicarbonate, and soap, in which the apparent carbonate to bicarbonate ratio is held within the range of 1:0.5 up to 1:2, by adding predetermined amounts of hydroxide of an alkali metal and an alkaline earth metal, in aqueous solution. A. L. Dubeau, to The Mathieson Alkali Works, Canadian Patent No. 459,509.

SOAP PLANT OBSERVER

By John W. McCutcheon

OVER the past several months it has been pointed out here that plant efficiency stems from the correct integration of considerable technical knowledge, a principle incidentally, not unique in its application to the soap industry. To achieve this goal requires trained personnel. With increased manufacturing complexity there is need for greater attention to the sources from which trained men can be obtained.

A step in the right direction is the short summer course on fats and oils conducted by the American Oil Chemists Society. Such an idea is very commendable but might be improved by providing a permanent headquarters where a complete course of post graduate work might be undertaken. As presently constituted there is no course for undergraduates, technical and high school students whose interest in further fat, oil and soap studies might be aroused. The chief reason for such a lack lies in the fact that there is no specific program for any such courses and that there are too few persons qualified in the field free to carry them out.

Fat, oil and soap chemistry are not easy subjects for the young chemist who has been trained to think in terms of pure compounds, only later to find out that everything he does must be interpreted in terms of averages. In addition to this natural complexity, the more intricate steps of synthetic detergent manufacture also are added which now must be considered a part of the soap industry. To name just a few topics which the technical soap man now must include in his repertoire and which were not required twenty years ago, are: strong acid handling, continuous solvent and low temperature extractions, fractional distillation, esterification, product evaluation, etc.

Many soapers are aware of the deficiency of preparatory schooling in

industry subjects and have endeavored to broaden the training of their men by forming supplemental oil and fat groups within the larger organizations by interplant meetings, by special conventions and by individual progress reports. It is believed that the time now is ripe for a vigorous program along these lines. A few suggestions might be in order:

Formation of a committee by either or both national organizations interested in soaps, oils and glycerine to have prepared a factual syllabus outlining a course suitable for high school use and another for college students which might form an integrated part of other courses in chemistry. These to include details of laboratory experiments. Such a syllabus would be distributed free to the proper educational authorities. Increased grants for scholarships on an industry basis rather than on a company basis.

The recent convention of the Association of American Soap & Glycerine Producers in New York was reported fully in the February issue of *Soap*. The following are a few quotations by meeting speakers that are of interest:

(1) Probably 300 million pounds more of tallow and grease would have been consumed in 1949 had it not been for synthetic detergents (Faure).

(2) Soap and detergent sales in 1949 are estimated at over 90,000,000 pounds (McElroy).

(3) "A synthetic detergent is soap with a college education" (Terry).

(4) Synthetic rubber manufacture is estimated to have required 22 million pounds of soap in 1949 (Ault).

(5) General Aniline is now ready to sell taurine to promote the manufacture of "Igepon" (Terry).

(6) Alkyl aryl sulfonates represented two per cent of the retail market in 1945, 10 per cent in 1946 and 38 per cent in 1949 (Hersberger).

THE sulfonation of alkyl aryl compounds heretofore has been done chiefly with concentrated or fuming sulfuric acid. Attempts to use SO_3 for this purpose therefore have some interesting possibilities.

General Chemical Division of Allied Chemical & Dye Corp., makers of "Sulfan" (stabilized SO_3), has worked out a process by which dodecylbenzene may be sulfonated to a 90 per cent plus active product by using a vaporized mixture of SO_3 diluted with air in the volume ratio of 75:25. While all kinks have not yet been ironed out in the small, laboratory size equipment used, it was demonstrated to the writer that the process is workable. Furthermore a high quality detergent can be made by the process and there are definite possibilities in development of the project as a continuous sulfonating unit.

Data are being made freely available to sulfonators as developed.

The chief advantage of using SO_3 is in the higher concentration of active material without going to extraction or stratification. Oleum or sulfuric acid are replaced by less than one-third their weight of "Sulfan."

In addition, savings are effected through dilution with purchased anhydrous sodium sulfate rather than by the neutralization of acid and alkali in situ. Where a heavy duty detergent is required, it affords the chance to build a product with a higher ratio of phosphates. Possible disadvantages include the lack of availability of stabilized SO_3 in foreign countries, greater care needed in handling, and the fact that capital will be required for proper development from laboratory to plant scale equipment.

THE problem of water disposal faces every large soap plant to some extent and the steps taken in its control depend largely on local conditions. For example, in glycerine evaporation and distillation, considerable quantities of cooling water are required for operation of the vacuum equipment. Where a river is handy a part may be diverted to such use with only the cost of pumping. In most cases however, it is advisable to have cooling towers installed for recirculation. This is particularly necessary where town or city supplies may periodically be limited. It also has the advantage of affording some check on distillation losses particularly if the water circulation is self contained within the units involved.

For a glycerine plant handling 400,000 pounds of crude and refined glycerine a month, the water system for an average summer temperature range of 85° F. will require a pumping capacity of about 925 gallons per minute through the cooling tower. At 75° F. the usage will drop to 650 gallons per minute. However, the circulation system must be designed for the maximum load. With a reservoir system containing 15,000 gallons, the water is circulated at the rate of almost four times per hour. Consideration of this problem will be continued in the next issue.

Tripolyphosphate Booklet

Westvaco Chemical Div., New York, has recently published an 18-page technical bulletin describing the properties and uses of sodium tripolyphosphate. The booklet discusses the chemistry of complex sodium phosphates, the physical and chemical properties of sodium tripolyphosphate, and includes shipping and packaging data.

The applications of the phosphates considered in the booklet include use with detergents, in detergent formulations, in water softening, textile processing, etc. Tabular data, graphs and photographic illustrations are included.

A.S.T.M. Tests for Water

A.S.T.M. standard methods of sampling, analysis and testing of industrial water are compiled into a new 142-page booklet by the A.S.T.M. Committee D-19 on Industrial Water. The methods have been developed particularly for the examination of water employed industrially in the generation of steam or for process or cooling purposes, and for the examination of deposits formed from such waters. Copies are available at $1.75 each from the American Society for Testing Materials, 1916 Race St., Philadelphia.

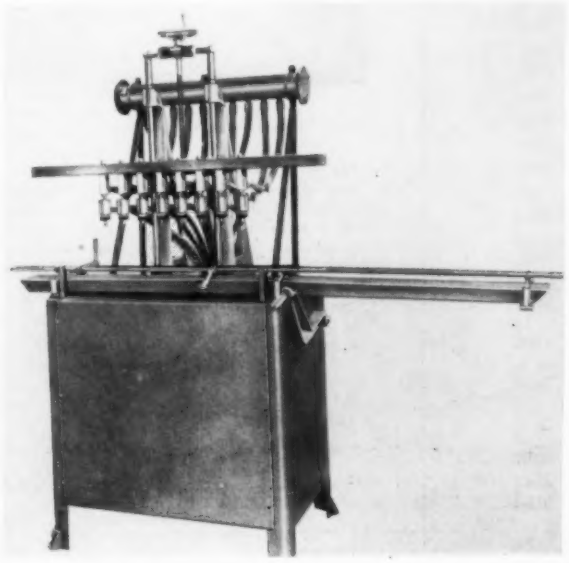
New Book on Halides

A new 136-page book, "Allyl Chloride and Other Allyl Halides," has been announced by Shell Chemical Corp., New York. The book reviews the chemical properties of the four allyl halides, $CH_2{=}CH{-}CH_2X$, storage and handling procedures, specifications and test procedures, and physical properties including infrared and ultraviolet spectra. More than one-half the book is devoted to a discussion of allyl halide reactions, which are classified by type and include compounds formed by the independent or simultaneous reaction of the olefinic bond and the halogen atom.

The book is appended with a 30-page bibliography and includes a chart which indicates diagrammatically reactions of the allyl halides. The book is available on request from Shell at 500 Fifth Avenue, New York.

New MRM Gravity Fillers

A new line of gravity filling machines was announced recently by MRM Co., Brooklyn. The feature of the MRM filler is a gravity spout without packing. This avoids contaminating and dripping, is readily cleanable and with it there can be no accumulation of material to jam spouts. The new unit is designed to fill all size containers from fractional ounces, with ¼ inch mouth opening, to two gallons. The liquid flows from an overhead tank by gravity into the head of the gravity filler, which is tapped to each spout. Models are available having from five to 12 spouts, with or without conveyor. All metal parts in contact with filling substance are made of stainless steel.



New gravity filling machine announced recently by MRM Co., Brooklyn, features few moving parts; no motor or pump. Can be used for filling foaming materials such as shampoos.

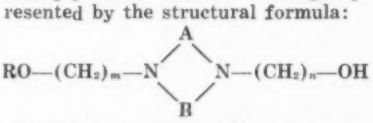
New Patents

(From Page 69)

justed to that concentration so that after the removal of the liberated alcohol, the soap mass on cooling is directly millable.

No. 2,489,965, Germicidal Compositions, patented by Harold G. Kolloff, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich., a corporation of Michigan. The patent covers a germicidal composition having synergistic germicidal effect against Staphylococcus aureus including as active germicidal ingredients (1) an acid addition salt of an alkyl amine containing at least one alkyl radical having from 8 to 18 carbon atoms, inclusive, and (2) a mercurial selected from the group consisting of mercuric chloride and ortho-hydroxyphenyl-mercuric chloride.

No. 2,491,992, Detergent Composition, patented by John David Malkemus, Allendale, N. J., assignor to Colgate-Palmolive-Peet Company, Jersey City, N. J., a corporation of Delaware. A detergent composition is described comprising essentially a surface-active organic sulphuric reaction product in the form of a water-soluble salt having detergent properties and having in its molecular structure a radical selected from the group consisting of sulphonic acid and sulphuric acid ester radicals, and an amount of a piperazine derivative equivalent to about 1% to about 500% by weight of said sulphonated organic compound, said piperazine derivative being represented by the structural formula:



where R is a member of the group consisting of alkyl and acyl radicals having about 5 to about 23 carbon atoms, A and B are members of the group consisting of an ethylene radical and alkyl derivatives thereof wherein any number of hydrogens in the ethylene radical are replaced by alkyl radicals of not more than two carbon atoms, and m and n are integers of 2 to about 5.

No. 2,486,922, Stabilized Detergent Composition, patented by Procter & Gamble Company, Ivorydale, Ohio, a corporation of Ohio. A heat dried cleansing and laundering composition is described in particulate form consisting essentially of a mixture of water-soluble salts of organic sulfuric reaction products having in their molecular structures a higher alkyl radical and a radical selected from the group consisting of sulfonic acid and sulfuric acid ester radicals, said salts having pronounced detergent power, and from one to five times as much by weight of a mixture of phosphates consisting principally of normal sodium tripolyphosphate and from about 10% to 35% of thermal decomposition products of sodium tripolyphosphate resulting from drying sodium tripolyphosphate at a drying medium temperature in excess of 212° F., and added alkali in amount to bring the alkalinity of water solutions of said composition in ordinary concentrations for laundering within a range compatible with the existence of tripolyphosphate wholly as a non-acid normal alkali metal tripolyphosphate and from about pH 8.8 to about pH 10.7, said composition having a greatly enhanced laundering performance, on repeated use of water solutions in washing successive batches of laundry, over that of an otherwise identical heat dried composition lacking said alkali and containing significant amounts of acid phosphate resulting from said thermal decomposition of normal sodium tripolyphosphate.

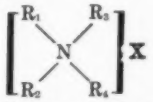
No. 2,486,921, Detergent Composition, patented by David R. Byerly, Wyoming, Ohio, assignor to The Procter and Gamble Company, Ivorydale, Ohio, a corporation of Ohio. A cleansing and laundering composition is covered characterized by balanced sudsing and detergent power, heavy-duty cleansing performance, stability

against deterioration during storage and use, resistance toward the curd-forming ingredients of hard water during washing and rinsing, and mildness toward colored fabrics and the skin, consisting essentially of a mixture of a water-soluble, alkali metal salt of an organic sulfuric reaction product having in its molecular structure a higher molecular alkyl radical having 8 to 18 carbon atoms and a radical selected from the group consisting of sulfonic acid and sulfuric acid ester radicals, the said salt having pronounced detergent power in aqueous solution, and sodium tripolyphosphate, the amount by weight of sodium tripolyphosphate being from two to five times the amount by weight of the water-soluble, alkali metal salt.

No. 2,494,580, Detergent Composition, patented by Walter C. Preston, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio, a corporation of Ohio. The patent covers a detergent composition characterized by reduced tendency to form lime soap curd when used in hard water, comprising essentially a ternary mixture of a water-soluble soap, a water-soluble salt of an organic sulfuric reaction product having pronounced detergent properties and having in its molecular structure a radical selected from the group consisting of sulfonic acid and sulfuric acid ester radicals, and an ester of allyl alcohol and a soap-forming carboxylic acid, the ratio of soap: sulfuric reaction product salt being from ½:1 to 8:1 and the ratio of sulfuric reaction product salt:ester being from 1:1 to 10:1, and the amount of ester constituting at least 2 per cent of the combined weights of soap, sulfuric reaction product salt, and ester.

No. 2,487,610, Process of Refining Glycerin, patented by Francis J. Sprules, Arlington, N. J., and Raymond Liebling, Brooklyn, N. Y., assignors to Nopco Chemical Company, Harrison, N. J., a corporation of New Jersey. Covered is a process for refining glycerine obtained by transesterification of a fatty material having an acid value of at least one wherein the fatty material is transesterified employing an akaline catalyst and then esterified employing an acid catalyst, the steps comprising neutralizing the acidic glycerine with a compound selected from the group consisting of the alkaline earth hydroxides and oxides, heating the glycerine with an ammonium halide, and then separating the glycerine from insoluble material formed therein.

No. 2,494,941, Pest Control Agents, patented by Milton Goll, Roselle, N. J., assignor to Nuodex Products Co., Inc., Elizabeth, N. J., a corporation of New York. The patent describes a new composition of matter useful as a pest control agent resistant to water leaching; an oil soluble solution containing at least one substantially water-insoluble metal salt of a mono-basic organic acid stabilized against water leaching by not more than 25% per weight of the metal salt of at least one substantially water-soluble quaternary ammonium compound having the following formula:



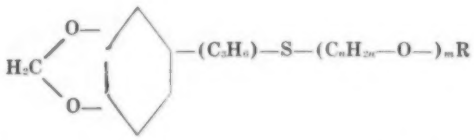
wherein R_1, R_2, R_3 and R_4 are organic radicals and X is an anion derived from a substantially water-soluble acid.

No. 2,494,827, Abrasive Detergent Compositions, patented by Casimir J. Munter, Upper St. Clair Township, Allegheny County, Pa., assignor to Hall Laboratories, Inc., Pittsburgh, Pa., a corporation of Pennsylvania. Covered is a finely divided free-flowing abrasive soap composition consisting essentially of from about 20% to about 50% of anhydrous sodium soap, from about 20% to about 60% corn meal, from about 2% to about 10% water-insoluble crystalline potassium metaphosphate, from about 5% to about 15% alkali-metal tripolyphosphate, from about 5% to about 10% hydrated borax, and about 0.1% or-

ganic agent to prevent rancidity of the soap while in storage.

No. 2,487,208, Preparation of Diglycerol, patented by William Godfrey Alsop, New York, N. Y., assignor to Colgate-Palmolive-Peet Company, Jersey City, N. J., a corporation of Delaware. This process for making diglycerol is covered which comprises heating glycerol in the presence of a catalyst to a temperature at which condensation - polymerization takes place for a period of time sufficient to produce a substantial amount of diglycerol, deactifying the catalyst before the amount of condensed glycerol exceeds 50%, and distilling the reaction mixture to recover unreacted glycerol and diglycerol.

No. 2,493,927, Methylenedioxyphenyl Compound as Insecticide, Insect Repellent, and Pyrethrin Synergist, patented by Edward A. Prill, Yonkers, N. Y., assignor to Boyce Thompson Institute for Plant Research,, Inc., a corporation of New York. An insecticidal composition is patented comprising an organic compound represented by the formula



where n is an integer 2 or 3, m is an integer not greater than 3, and R is an univalent radical of the group consisting of alkyl, aryl, alkaryl and aralkyl radicals, and nuclear mono substituted aryl, alkaryl and aralkyl radicals in which the nuclear substitutent is a member of the group consisting of halogen and alkoxy; and in the above formula, the portion to the right of the sulfur atom contains not more than 16 carbon atoms, and a petroleum distillate in which the compound is dissolved.

No. 2,486,459, Urea-Formaldehyde Condensates Having Detergent Properties, patented by Louis H. Bock, Huntingdon Valley, and James L. Rainey, Abington, Pa., assignors to Rohm & Haas Company, Philadelphia, Pa., a corporation of Delaware. Surface-active, polymeric compositions are described comprising a water-soluble, sulfonated condensate of urea, formaldehyde, and an unsubstituted saturated aliphatic monohydric alcohol containing six to eighteen carbon atoms prepared by sulfonating by heating a condensate of one mole of urea, 1.75 to 3.0 moles of formaldehyde, and 0.4 to 0.8 mole of a saturated unsubstituted aliphatic alcohol containing six to eighteen carbon atoms with 0.15 to 0.5 mole of a water-soluble metal salt of sulfurous acid.

No. 2,489,955, Preparation of Nondusting Organic Detergent Compositions, patented by Robert Bangs Colgate, Washington, D. C., Emil Edward Dreger, Summit, and Kenneth Lyman Russell, Nutley, N. J., assignors to Colgate-Palmolive-Peet Company, Jersey City, N. J., a corporation of Delaware. The process of preparing improved detergents is covered which comprises spray-drying an aqueous alkaline preparation of a sodium salt of an alkylated aryl sulphonic acid, glycerine, and a monoglycerine of a fatty acid having at least six carbon atoms.

No. 2,490,924, Stabilized Rosin Amine Pest Control Composition, patented by Glenwood L. Schertz, Wilmington, Del., assignor to Hercules Powder Company, Wilmington, Del., a corporation of Delaware. A pest control composition is covered in the form of a dust comprising a compound of the group consisting of a stabilized rosin amine and the coordinate covalent salts thereof admixed with a substantial amount of a material of the group consisting of pyrophyllite, bentonite, and kieselguhr.

No. 2,490,925, Stabilized Rosin Amine Pest Contol Composition, atented by Glenwood L. Schertz, Wilmington, Del., assignor to Hercules Powder Company, Wilmington, Del., a corporation of Delaware. The patent covers a pest control composition comprising a compound of the group consisting of a stabilized rosin amine and the coordinate covalent salts thereof in a substantial amount of a dispersing medium of the group consisting of kerosene, gasoline, benzene, alcohol, acetone, water, and pine oil.

No. 2,490,481, Stabilized DDT Solutions, patented by Walter A. Schulze and John Carpenter Hillyer, Bartlesville, Okla., assignors to Phillips Petroleum Company, a corporation of Delaware. A solution of DDT in a petroleum solvent is described containing sufficient DDT to be supersaturated at —10° F. and also containing a gum selected from the group consisting of gum guaiac, gum benzoin and mixtures thereof in proportion in the range from 0.05 per cent by weight up to saturation of the solution with gum.

No. 2,491,051, Method of Producing, Adsorbent Cleaning Composition, patented by William S. W. McCarter, Ardmore, Pa., assignor to Attapulgus Clay Company, Philadelphia, Pa., a corporation of Delaware. The patent describes a method of producing an adsorbent cleaning composition, which consists in incorporating from 0.1% to 5% by weight of a surface active agent in plastic fuller's earth the water content of which is between 50% and 60% by weight, drying the mixture, reducing the dried mixture to granular particles, and calcining the granular particles at a temperature between 750° F. and 1200° F.

No. 2,489,713, Manufacture of Fatty Acids, patented by William M. Leaders, Chicago, Ill., assignor, by mesne assignments, to Swift & Company, Chicago, Ill., a corporation of Illinois. The patent describes a process for the manufacture of fatty acids and glycerine from fats which comprises splitting the fat in the presence of water into a mixture of glycerine and fatty acids of higher and lower melting points, utilizing the sensible heat in the product of the fat splitting to remove water from the mixture, commingling the resulting mixture with an inert and volatile organic solvent having a preferential solubility for the lower melting point fatty acids and glycerine at low temperatures, cooling the resulting solution to crystallize a higher melting point fatty acid fraction and separating the crystals from the solution of solvent, melting fatty acids and glycerine.

No. 2,490,958, Pest-Combating Compositions and Spraying Liquids of Enhanced Adhering Capacity, patented by Charles Graenacher, Riehen, and Max Matter, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland, a Swiss firm. A composition of matter suitable for the preparation of a spraying liquid is described, containing as its essential ingredients a pest-combating agent selected from the group consisting of insecticides and fungicides which are sparingly soluble to insoluble in water, an aminoplastic consisting of a hardenable reaction product of formaldehyde with a member of the group consisting of urea, thiourea, cyanamide, dicyandiamide, dicyandiamidine and melamine, and a hardening accelerator consisting of an ammonium salt of a strong acid, the said aminoplastic being present in a proportion amounting to at least 8 per cent, and the hardening accelerator being present in a proportion insufficient to damage horticultural products to which the spraying liquid may be applied but in an amount of at least 4 per cent, both percentages being calculated relative to the total content of non-aqueous constituents of the spraying liquid to be prepared therefrom, which composition gives a spraying liquid having a pH-value of at least 5.

SANITARY PRODUCTS SECTION

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Floor Products • Polishes • Chemical Specialties

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29 years in business and one of America's leading manufacturers of soaps ONLY is a testimonial to the standard quality of our products.

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Standard (60%) Coconut Oil Base
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U.S.P. Powdered Castile Soap
Castile, Bar, U.S.P. (40-lb. cartons)
Powdered Coconut Oil Soap

★ Ideal for bottling. Never any sediment or precipitation. Our patented process assures brilliant clarity at all times.

Patent No. 2,402,557

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Use of lugs instead of threads effect many advantages in *Anchor* Amerseal Caps. By engaging underside of corresponding glass threads they draw liners down into airtight, leakproof contacts with container finishes. They hold liners permanently captive—prevent them from falling out in handling or application. They permit caps to be sealed with a simple quarter turn. Thus they speed up production and reduce costs. And of equal importance, they make Amerseals the easiest, quickest of all closures to remove. We would like to tell you more of the advantages of *Anchorglass* Blakes and *Anchor* Amerseal Caps, to submit samples and prices. May we?

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ANNOUNCING KINETIC'S NEW

Tells what

Why they

WHAT THE SURVEY IS. To ascertain exactly what retail dealers think of aerosol dispensers of insecticides, moth killers, vermicides, deodorants, car waxes and the many other products of this type, Kinetic Chemicals, Inc., has just completed a nation-wide market survey. Calls were made upon more than 500 retailers by special representatives of an established research organization. They obtained unbiased answers to questions relating to the manufacture and sale of aerosols. Owners were seen and interviewed in department, drug, hardware, dime and food stores, and in service stations from coast to coast.

GROWING MARKET. Sales of aerosol-type dispensers continue to expand. Largest volume is still represented by insecticidal aerosols . . . the first to appear on the commercial market. However, more people today know about aerosols for varied purposes, and many more are showing a healthy inclination to buy them. The market appears even more promising now than it did a year ago.

DEALER DISTRIBUTION. Two thirds of all dealers interviewed stocked aerosol products; one third did not. Food stores were most numerous among those not stocking, and lack of demand the most frequently mentioned reason.

KINETIC
REG U.S. PAT. OFF.

"FREON"

AEROSOL MARKET SURVEY

dealers think of Aerosols

stock them . . . why they don't

PRODUCT SATISFACTION. 86% of all dealers who stock aerosols felt that the aerosol principle of dispensing products is catching on with the public; 4½% did not think so; 9½% didn't know. In addition, 83½% of the dealers are convinced that the aerosol method of dispensing is superior to other methods; 12½% said it was about the same, while only 4% said it was inferior or that they didn't know.

LOW PRESSURE VS. HIGH PRESSURE. The survey indicated that 43% of the dealers interviewed stocked both the low-pressure and the high-pressure types of aerosol dispensers. Of these, 34% reported the high-pressure aerosol the best seller; 40% said the low-pressure sold best; 26% said they sold about the same. Of course, dollar volume per sale is greater for the high-pressure aerosol.

Of the dealers who stock only one type of aerosol, 38% had only the low-pressure, and 18% only the high-pressure.

(*To assist in determining practicable propellent pressures for various aerosol formulas, Kinetic has prepared charts showing pressures readily obtained with "Freon" compounds. They will be sent upon request.*)

SALES OBSTACLES. A large majority of dealers (83%) reported no objections to aerosols from their customers. Of the 17% who did voice such objections, price was mentioned as an obstacle, while other customers complained of mechanical imperfections, and some were afraid that aerosol ingredients might prove unsafe.

"FREON" PROPELLENTS FOR SAFETY. Even the most carefully prepared formulas must be safely, satisfactorily and simply dispensed at all times. That is why by far the largest percentage of aerosol packages today contain "Freon" safe propellents. These propellents *are safe* . . . nontoxic, nonflammable, nonexplosive, and almost totally odorless. They won't harm flesh, foods, fabrics, furs or finishes; nor will they corrode or otherwise damage containers in which they are used.

ASK FOR COPY OF SURVEY. Only a few of the facts disclosed in this important aerosol dealer-market survey can be summarized here. A complete digest will be ready soon. It's the only market report of its kind available. We believe it will be an invaluable aid to all concerned with the aerosol industry. It's absolutely FREE . . . just write us on your company letterhead to get your copy. We'll send it as soon as it's ready. Kinetic Chemicals, Inc., Tenth and Market Streets, Wilmington 98, Delaware.

"Freon" is Kinetic's registered trade-mark for its fluorinated hydrocarbon propellents.

SAFE PROPELLENTS

MONSANTO QUALITY CAN HELP YOU make potent products and worth-while profits

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SANTOCHLOR* (*para*-Dichlorobenzene)
SANTOPHEN* 20 (Pentachlorophenol, Tech.)
TRICHLOROBENZENE, Technical
NIFOS*-T (Tetraethyl Pyrophosphate, Tech. For agricultural use only)
NIRAN* (Parathion. For agricultural use only)

HERBICIDAL CHEMICALS

2, 4-D ACID
2, 4-D SODIUM SALT
2, 4-D ISOPROPYL ESTER
2, 4, 5-T ACID
2, 4, 5-T ISOPROPYL ESTER
SANTOBRITE* (Sodium Pentachlorophenate, Tech.)
SANTOPHEN 20 (Pentachlorophenol, Tech.)
ISOPROPYL N-PHENYL CARBAMATE

Within the large and versatile group of Monsanto Chemicals for insecticides and herbicides, formulators will find many that are helpful in making effective products and worth-while profits. There's an added value in these Monsanto chemicals—since they are made to highest standards of potency and purity, they do much to guard the reputation of formulators who use them. Order your stocks *now* . . . be ready for the greater demands and increased profits of 1950.

For further information and quotations, qualified formulators are invited to mail the coupon or to contact the nearest Monsanto Sales Office. MONSANTO CHEMICAL COMPANY, Desk A, Organic Chemicals Division, 1767 S. Second St., St. Louis 4, Mo.

DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

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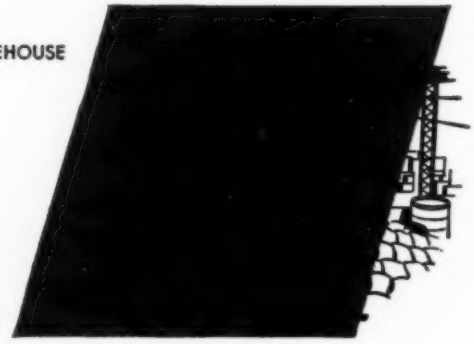
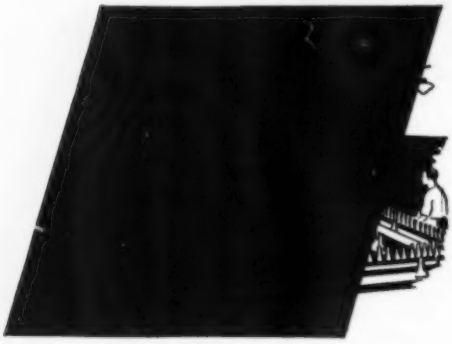


for SAFETY in your Food Plant Insecticides

FOOD PROCESSING PLANT



BOTTLING PLANT

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Fast, positive knockdown and kill . . . time-saving convenience . . . freedom from toxicity, skin irritants and objectionable odors—such is the unique combination of advantages you can offer *your* customers when you base your area-type sprays on Pyrenones*. Use Pyrenones in your residual-type sprays too. They give a combination of safety, effectiveness and staying power that no other insecticide we've tested can approach.

Effective in economical concentrations against the chocolate moth . . . cheese mites and skippers . . . grain insects like the confused flour beetle and the cadelle . . . houseflies, fruit flies, roaches, ants, and other common insects . . . Pyrenone-based emulsion and oil sprays are the natural choice for a wide range of insect control jobs. Where foodstuffs are handled, their safety makes easier, faster work of pest control operations.

Want further information about Pyrenone Concentrates suitable for use in *your* insecticide formulations? We'll be glad to furnish it on request if you'll tell us briefly what type of insecticide interests you.

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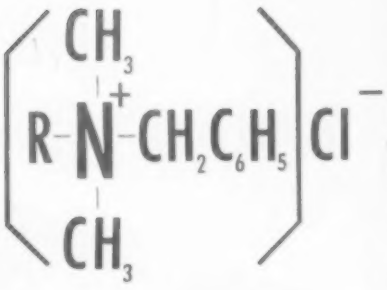

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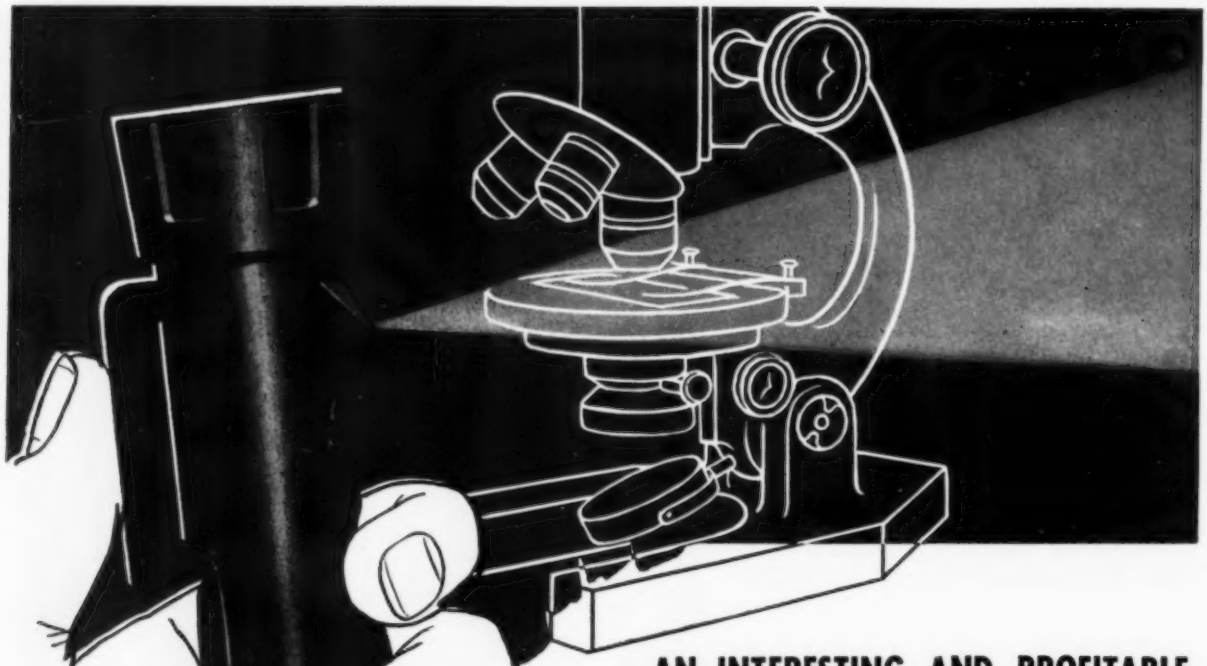

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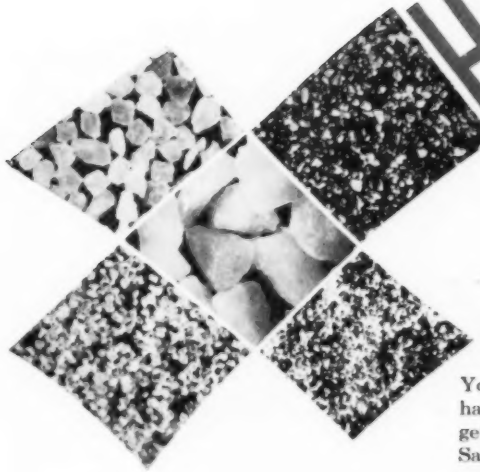

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ALARMINGLY careless handling of rodenticide "1080" in food plants has been reported by inspectors of the Food & Drug Administration, according to the recently issued report of the FDA for the year ended June 30, 1949. Efforts have been made by both the manufacturer and the National Pest Control Association to insure more careful handling and application of this rodenticide, the use of which is restricted to trained pest control operators and public health personnel. Rules for the safe use of "1080" have also been established by the National Research Council, which FDA recommends users to follow. However, in spite of all the precautions necessarily set up around this highly effective material, several accidental deaths have been reported, although no injury yet has been reported from consumption of a food, drug or cosmetic contaminated with the rodenticide.

Remembering the hue and cry that was set up last summer over the toxicity of DDT and in view of the need for public protection against the hazards of a material as toxic as "1080", it seems hardly necessary to advise everybody again to handle this product with extreme care. For those that don't, and there will be some, there should be stiff penalties.

UNLESS manufacturers of DDT and other chlorinated compounds jog up their outputs over the next sixty days, comment says these basic insecticide materials could be uncomfortably scarce come May 1. Early movements to processors, the prolonged coal strike and several heavy U. N. commitments indicate that available stocks will be materially reduced. In spite of reports of growing insect tolerance to chlorinated insecticides, plans for 1950 appear to include, if anything, a wider use of DDT, chlordane, lindane, et al, than heretofore. From whence will they come?

THE floor wax industry is currently beset with two worries. Although they seem to be unrelated, the feeling in the trade is that a very definite connection exists between the trade practice rules being formulated by the Federal Trade Commsision and the proposed revision of the Bureau of Federal Supply's Specification 784, covering water emulsion floor wax. The link between the two lies in the definition of the industry's product. In other words, how much wax must a floor wax contain to be considered a floor *wax?* That question was asked at one of the preliminary hearings of industry and F.T.C. representatives. In writing a specification for water emulsion type floor wax, based on the contents of the product, the Bureau of Standards asked for guidance on the point. Little was forthcoming, since it was felt that if a specific wax content were included, the F.T.C. would use this as its yardstick in measuring quality of floor waxes in its trade practice rules for the industry.

All this raises the larger question, which is more important, the formula of a product or its performance? The feeling of the industry seems to favor performance, and wax manufacturers state very bluntly that government specifications can be met by a wax of strictly inferior quality. Such a wax, industry members say, could not be sold in commerce, where without benefit of specifications, the consumer buys a superior product. The government people seem to acknowledge this and indicate that they would be willing to buy standard commercial waxes. The drawback? Nothing but the minor detail of price.

"We'll sell you such a wax", say the manufacturers, "but are you willing to pay for it?" Those manufacturers who have submitted their standard brands on government bids do not need to be told again what the answer is. As a result, quality answers the same description.

HOUSE FLY TOLERANCE *for insecticides*

By W. N. Bruce and G. C. Decker *

Illinois Natural History Survey

SINCE the appearance of DDT-resistant house flies, reported as early as 1947 by Wiesmann and by Sacca, entomologists have speculated as to what effect this development would have on the future of insecticidal applications of residual toxicants for the control of flies and other insects. The studies described herein were designed to determine some practical answers to a number of pertinent questions regarding house fly tolerance for insecticides.

Method of Study

STUDIES to determine the course followed in the acquisition of tolerance were initiated with the NAIDM laboratory strain of the house fly, *Musca domestica L.* The house flies were treated with toxicants in order to eliminate the susceptible flies and induce inbreeding among flies having resistant characters. In general the treatment of flies in the adult stage alone was not successful, during the periods of observation, in producing strains highly tolerant of DDT. However, the treatment of flies in both the larval and adult stages greatly intensified natural selection and inbreeding, thereby hastening the production of strains resistant to several toxicants. In the preliminary work it was necessary to regulate the dosage of toxicants added to the standard NAIDM medium and also in the adult environment, since an overdose merely eliminated the strain. Special larvacidal tests revealed the near maximum tolerance of the immature stages for each toxicant. Larvae of a laboratory strain of flies (Lab Strain I) tolerated up to 80 ppm DDT, 320 ppm methoxychlor, 160 ppm lindane, 5 ppm chlordane, and 1.2 ppm dieldrin. As the strains acquired more tolerance, the amount of toxicant in the larval and adult environment was increased. In fact, when the strains became highly resistant to the insecticide, the larvae tolerated over 200 times as much toxicant as was tolerated by susceptible larvae.

Observations in the field suggest that the contamination of breeding media has likewise contributed to the development of DDT-resistant flies in nature. The average insecticide application on a ceiling area will usually result in about 50 per cent of the toxicant finding its way to the floor through drift and dripping. The floor often appears as wet as the ceiling. Evident symptoms of insecticide poisoning soon after emergence and a high rate of mortality in adult flies reared from field-collected pupae have frequently indicated the possible storage of the toxicant in the larval stage. In one instance these effects were evident for more than three months after a single residual application of a 0.3 per cent dieldrin spray.

During the early summer of 1949 the authors found a situation in which filter flies, *Psycoda alternata* Say, were no longer inhibited by DDT treatment of the larval habitat. The filter beds had been successfully treated with DDT for two years, and when DDT failed in 1949 another insecticide was tried. The first chlordane treatment was highly successful and resulted in nearly complete eradication of the pest for 4 to 5 weeks. The second treatment with chlordane was less effective, and the third and fourth treatments were near failures. Here again it appeared that an increased tolerance to a toxicant was acquired largely through the treatment

* Mr. Bruce is Assistant Entomologist, Illinois Natural History Survey. Mr. Decker, Entomologist and Head, Section of Economic Entomology, Illinois Natural History Survey, and Entomologist, Illinois Agricultural Experiment Station. Address before A.A.E.E., Tampa, Dec. 16, 1949.

of the larval stage. Other instances of resistance to toxicants developed by insects through treatment of both the immature and adult stages have been exhibited by mosquitoes (U.S.D.A. press release of November 21, 1949), scale insects (Quayle, 1916), and citrus thrips (Boyce, 1942).

In determining the susceptibility or resistance of a strain of flies, data obtained from topical applications were used to compute the LD-50 values in micrograms per gram weight of the adult fly. This method of evaluating the level of resistance to insecticides by house fly strains was employed throughout the study. Toxicants for topical applications were dissolved in acetone and applied to the thorax of adult female flies with a micro-syringe. Equivalent amounts of the solvent alone had no effect on the flies.

The following chemicals were used: DDT, 2,2′-bis(para-chlorophenyl - 1,1,1 - trichloroethane; technical chlordane, 60-75 per cent, 1,2,4,5,6, 7,8,8 - octachloro - 4,7 - methano - 3a,4,7, 7a-tetrahydroindane and 25-40 per cent related compounds; lindane, gamma isomer of 1,2,3,4,5,6-hexachlorocyclohexane; toxaphene, a chlorinated camphene; methoxychlor, 4,4′-dimethoxy-diphenyl trichloroethane; V4 or para-oxon, diethyl p-nitrophenyl phosphate; "20 per cent piperonyl butoxide and 2 per cent pyrethrins in No. 9 oil"; dieldrin, 1,2,3,4,10,10-hexachloro - 6,7 - epoxy - 1,4,4a,5,6,7,8, 8a - octahydro - 1,4,5,8-dimethanonaphthalene.

Acquisition of Tolerance

THE course followed in the development of a strain of flies resistant to DDT is shown by the graph for the DDT strain I of flies (fig. 1) which was developed from the NAIDM or Lab Strain I. It would appear that the process of segregation or the initial establishment of resistance to DDT is slow, but when resistance is once established, its intensification is rapid and proceeds to equilibrium with the toxicant found in the strain's environment. The DDT Strain II (fig. 1) was produced from the DDT Strain W (table 1) which was collected in the field and had a fair degree of resistance (30-55 times normal) when discovered in 1948. Prior to the application of new DDT pressure the wild foundation stock of DDT Strain W had in the absence of further exposure to DDT remained at a constant level of DDT tolerance (505 mg./kg.) for 12 generations. When again exposed to DDT in the laboratory it produced in only three generations a strain (DDT

Table 1.--Topical Applications Showing Comparative 24 Hour LD 50's of Toxicants in Micrograms Per Gram Weight of the Several Strains of House Flies.

Strain	Generations Exposure of Larvae & Adults to the Toxicants	Origin of Strain	Toxicants								
			DDT	Methoxy-chlor	Lindane	Chlordane	Dieldrin	10:1 Mixture of Piperonyl-butoxide and pyrethrins	Toxaphene	16.6% DDT 83.4% Meth-oxychlor	Para-oxon
DDT I	21	Lab I	13,040.0	721.0	5.52	12.1	2.4	88.7	73.0	466.6	3.8
DDT W	3 years in field.	Field	505.5	76.4	2.1	4.1	1.3	74.8	38.4	-	-
DDT III	4 years in field.	Field	1,350.0	461.2	2.2	5.1	1.0	65.8	-	-	-
Methoxy I	21	Lab I	19.2	9,176.0	3.75	12.9	1.49	80.2	38.2	95.6	2.3
Lindane I	21	Lab I	18.2	-	33.4	14.7	2.66	62.5	66.3	-	-
Multi I	8	DDT I	18,728.0	14,586.0	8.56	15.6	2.33	89.9	76.4	4,851.1	6.2
Dieldrin I	21	Lab I	15.1	-	2.8	11.2	6.31	-	-	-	-
Chlordane I	21	Lab I	16.2	-	2.2	10.7	1.9	-	-	-	-
Lab I	-	NAIDM	16.8	49.95	1.7	8.2	1.1	56.8	29.16	47.2	2.6
Lab II	-	U. of I.	8.96	50.0	2.2	4.2	0.87	49.1	32.2	-	1.9
Para-oxon I	8	Lab I	-	-	-	-	-	-	-	-	10.0
Pyro I	21	Lab I	34.7	-	7.7	19.9	3.98	258.7	-	-	-
Multi III	8	Methoxy I	135.1	1,334.0	25.0	66.6	8.3	81.6	-	-	-
Multi IV	4	"	18.8	9,277.0	7.38	18.2	-	-	-	-	-
Multi II	4	"	20.0	10,444.0	5.3	-	7.1	-	-	-	-
Toxaphene I	21	Lab I	-	-	-	-	-	-	39.6	-	-

Strain II) as resistant as the DDT Strain I which was produced from Lab Strain I after a similar exposure to DDT for 18 generations in the laboratory.

The long period of slow initial acquisition of tolerance was also shown by flies from Lab Strain I in the course of developing a strain resistant to methoxychlor (Methoxy Strain I, fig. 2). The rapid increase in tolerance for methoxychlor in later generations was also evident.

When DDT resistant Strain I, which had acquired some resistance to methoxychlor, was continuously exposed to methoxychlor, as in the case of DDT, the slow initial stages were by-passed, and in five generations a strain of flies (Multi Strain I) was produced which exceeded the Methoxy Strain I in its tolerance for methoxychlor.

This added resistance is unexplained but may be attributed to some chemical, physiological, or morphological change incurred in acquiring resistance to two related but distinct compounds. It is interesting to note, also, that in acquiring a high degree of tolerance for methoxychlor this strain added to its tolerance for DDT without additional DDT pressure. (See Multi Strain I, table 1.) The data indicate that the acquisition of tolerance for one contributes to the tolerance of the other. This same phenomenon is evident in fig. 3 where tolerance for dieldrin was more readily acquired in developing Multi Strain II from Methoxy Strain I, which had some resistance to dieldrin, than it was in developing the Dieldrin Strain I from Lab Strain I, which had no resistance to begin with.

The acquisition of lindane resistance by the Lab Strain I when subjected to lindane pressure was somewhat more gradual (fig. 4) than was the case with DDT type toxicants.

Under the pressure of a 10:1 mixture of piperonyl butoxide and pyrethrins the Pyro Strain I was developed from the Lab Strain I (fig. 5). In the course of its development the Pyro Strain I appeared to follow the DDT-methoxychlor pattern with little change at first but with a more rapid intensification of tolerance for the pyrenone combination after the 12th generation.

The Para-oxon Strain I exhibited a four to five-fold increase in tolerance to para-oxon in eight generations (table 1).

House fly tolerance for toxi-

TABLE 2.

LD-50 value of DDT on two field strains of flies expressed in micrograms per gram weight of fly.

	Farm A		*Farm B*	
Year	*Treatment on farm*	*/Grm. LD-50*	*Treatment on farm*	*/Grm. LD-50*
1945	DDT	10.1	DDT	8.9
1946	DDT	14.9	DDT	20.4
1947	DDT	40.2	DDT	35.6
1948	DDT	405.5	DDT	450.0
1949	Dieldrin[1]	199.0	Lindane[2]	427.1

[1] Barns completely insulated and old DDT covered.
[2] Much DDT still adhering to the walls, etc.

Fig. 1

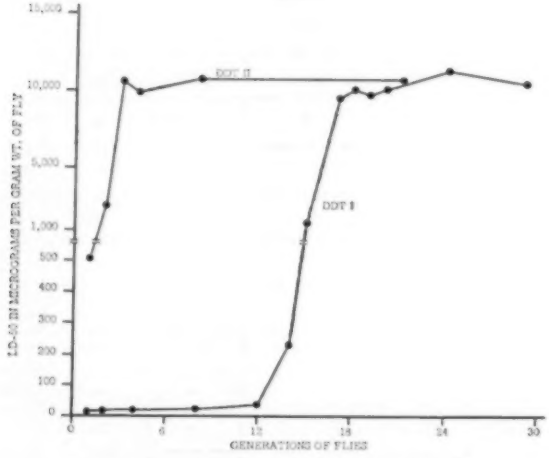


Figure 1.—LD-50 curves of DDT by topical application on female house flies for successive generations during the development of DDT Strain I and DDT Strain II of flies. Larvae and adults of each generation exposed to DDT.

Fig. 2

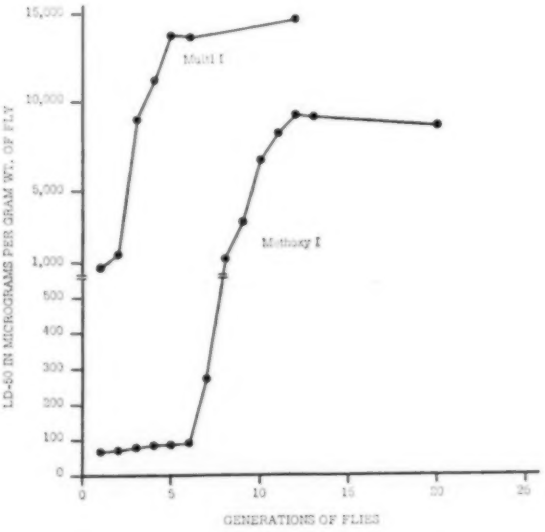


Figure 2.—LD-50 curves of methoxychlor by topical application on female house flies for successive generations during the development of Methoxy Strain I and Multi Strain I. Larvae and adults of each generation exposed to methoxychlor.

Fig. 3

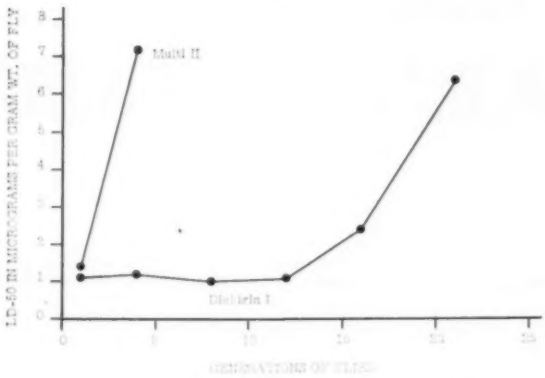


Figure 3.—LD-50 curve of dieldrin by topical application on female house flies for successive generations during the development of Dieldrin Strain I and Multi Strain II. Larvae and adults of each generation exposed to dieldrin.

Fig. 4

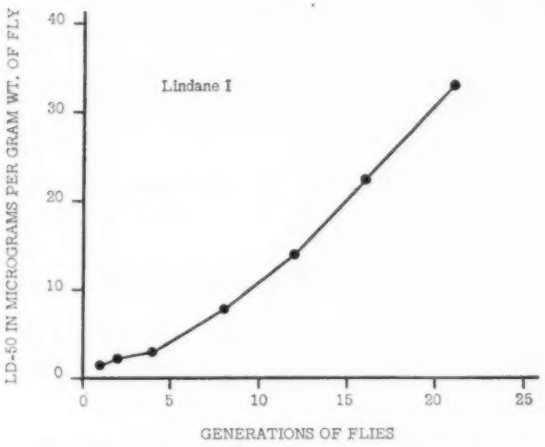


Figure 4.—LD-50 curve of lindane by topical application on female house flies for successive generations during the development of Lindane Strain I. Larvae and adults of each generation exposed to lindane.

cants such as chlordane, toxaphene, dieldrin, lindane, and para-oxon was slow to develop. Increases in tolerance for most of the toxicants were noted in the Methoxy Strain I and more notably in Multi Strain III (table 1), which is being developed under the pressure of a mixture of toxicants (DDT, chlordane, lindane, and toxaphene). (See table 1).

Retention of Tolerance

ALL strains of DDT resistant flies studied have retained their respective levels of tolerance when placed in a toxicant-free environment. Even the field collected DDT Strain III when retained in the laboratory for over 30 generations showed no significant loss of DDT tolerance. When the DDT Strain III, fig. 7, was crossed with the susceptible Lab Strain I, the resulting cross retained its intermediate LD-50 position and heterogeneity in dispersion for 15 generations when reared in the absence of DDT. It would appear by inference that if the chemical was entirely removed in the field, then the resistant strains might be effectively diluted by interbreeding with

(*Turn to Page* 145)

Fig. 5

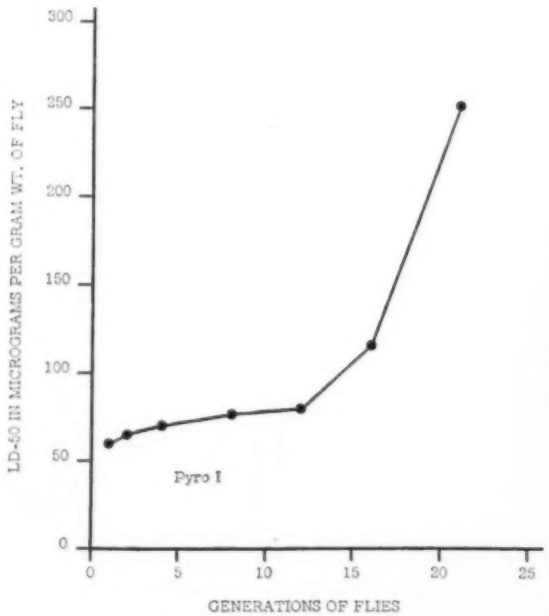


Figure 5. — LD-50 curve of 90% piperonyl butoxide and 10% pyrethrins by topical application on female house flies for successive generations during the development of Pyro Strain I. Larvae and adults of each generation exposed to piperonyl butoxide and pyrethrins.

Fig. 6

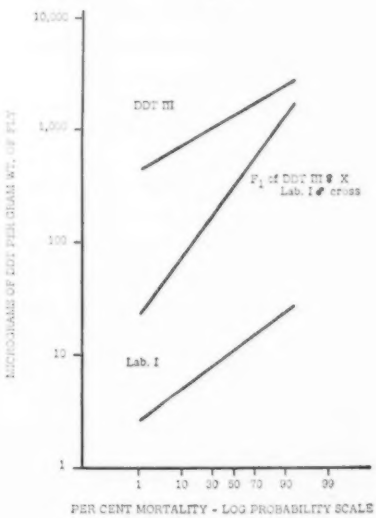


Figure 6.—Dosage mortality curves of DDT applied topically to female house flies of DDT Strain III, Lab Strain I, and the F1 of the cross DDT Strain III ♀ X Lab Strain I ♂.

Practical aspects in the application of

QUARTERNARY A

DURING the past few years there has appeared in the literature a number of articles showing the germicidal deficiencies of quaternary ammonium compounds. At the same time a number of articles has appeared which indicates that the quaternaries are good sanitizers. As a result, considerable doubt and confusion exist as to the value of these products as sanitizers for food and milk utensil sanitization.

Valko and DuBois (1) in 1944 were the first to show that quaternary ammonium compounds can be neutralized so that organisms which have been exposed to the action of the compound can, at least in part, be recovered by introducing an anionic wetting agent. Since then a number of articles have appeared that show that many compounds such as anionic wetting agents, soaps and hard water ions will neutralize the germicidal activity of these products.

Ridenour and Armbruster (2), James (3) and others have demonstrated that quaternaries are very strong bacteriostats. James reported that five quaternaries varied in bacteriostatic titres from 1-100,000 to 1-800,000 for *Micrococcus pyogenes aureus* and 1-50,000 to 1-120,000 for *Salmonella typhosa*. These data show definitely that if these organisms, or organisms with similar bacteriostatic sensitivity, were present in a substrate of the above dilutions of the quaternary, no growth would result. These data do not in any sense mean that these compounds are not necessarily germicidal.

If these bacteria were exposed to sub-lethal doses of a quaternary ammonium compound and subsequently the compound were removed by neutralization, no growth would result. If a neutralizer were introduced, at least some of the bacteria will recover. The fact that only some do recover indicates that even in sub-lethal doses some germicidal action has occurred.

If the dosage were increased from a sub-lethal to a lethal concentration and all the cells were properly exposed to the lethal activity of the compound, then no growth will occur with or without the addition of the neutralizer.

There have been few demonstrations presented in the literature of re-activated cells which have been exposed to quaternaries. Most of the studies such as those of Armbruster and Ridenour (2) and Goetchius (4) to demonstrate neutralization of quaternaries were made by mixing the quaternary and the neutralizer together and then subsequently adding test organisms. If no organisms were killed by the mixture it was reported that the

Table 1

The Supervised Field Test Made in an Insanitary Tavern Using a Quaternary Ammonium Compound Detergent Sanitizer Wash, Rinsing in Clean Water and Sanitizing in a Quaternary Ammonium Compound Solution

Bacterial Population in Tanks

Sampling	*Wash Tank*	*Rinse Tank*	*Sanitizing Tank*
At Start	144,000	54,000	2,200
100 Glasses	1,050,000	44,000	800
200 Glasses	2,710,000	200,000	1,500
300 Glasses	81,000,000	630,000	1,700
400 Glasses	102,000,000	1,360,000	2,300

Rinsed Glasses		*Sanitized Glasses*	
Glass No.	*Bacterial Count*	*Glass No.*	*Bacterial Count*
10	1260	20	80
30	2850	40	200
50	1970	60	70
70	900	80	2140
90	3000	100	550
110	3000	120	280
130	3000	140	310
150	3000	160	60
170	3000	180	40
190	3000	200	10
210	3000	220	320
230	3000	240	20
250	3000	260	10
270	3000	280	260
290	3000	300	40
310	3000	320	30
330	3000	340	670
350	3000	360	30
370	3000	380	750
390	3000	400	1600
410	3000	420	120

* Taken from National Sanitation Foundation Research Bulletin No. 2, 1949.

* Before the Annual Meeting, Chemical Specialties Manufacturers Assn., Washington, D. C., Dec. 5, 1949.

Y AMMONIUM COMPOUNDS

By W. L. Mallmann and R. J. Harley*
Department of Bacteriology and Public Health
Michigan State College, East Lansing

product was a good neutralizer. These data show that when a quaternary and a neutralizer, such as naphuride sodium or Tamol N, are mixed in water they react and produce a product which has no germicidal power. The fact that a product will neutralize a quaternary in water does not necessarily indicate that it will remove the quaternary which has been adsorbed on the bacterial cell. It further does not indicate that quaternaries cause bacteriostasis.

There are, however, a few instances in the literature showing that bacteriostasis does occur. Ridenour and Armbruster (5) showed by swab rinses of glasses, soiled with milk seeded with *M. pyogenes aureus*, that swabs made with buffer solution failed to yield viable bacteria whereas a buffer containing naphuride sodium yielded organisms particularly when the platings were made with a Tween-Azolectin agar.

These data do not indicate that a quaternary in a concentration of 200 p.p.m. is not a good germicide or that cells that have adsorbed quaternary are recoverable, but the data show definitely that these compounds do not have the property of penetrability. The bacteriostatic action is likely due to the amount of free quaternary present in the solution on the beverage glass.

These data yield information comparable to those of Weber and Black (6), who reported that the progressive death rate of quaternary can be stopped by the introduction of a neutralizing agent. The neutralizing agent did not reactivate those cells already indicated as dead, but it caused a marked reduction in the death rate. These data do not show an elimination of bacteriostasis on the cells, but they do definitely indicate that free quaternary in the test solution has been neutralized.

Kivela, Mallmann and Churchill (7) demonstrated bacteriostasis due to the adsorbed quaternary when they used resistant spores of *Bacillus subtilis*. They were able to demonstrate the presence of the quaternary on the spores by measuring the electrophoretic mobilities of the individual spores. These spores failed to grow when placed in nutrient agar, thus showing complete bacteriostasis. When an anionic neutralizer was added, a few spores grew, indicating that the neutralizer had removed quaternary from some of the spores. However, when the spores were washed repeatedly, the quaternary was removed from the spore walls as demonstrated by electrophoretic mobilities and further by plating on nutrient agar. Even with a dosage of 1-1,000 of quaternary, kill stopped after two minutes exposure. The kill obtained in the first two minutes was approximately 50 per cent.

These data show that neutralizers such as the anionic types are not good neutralizers and that either washing or simple dilution and shaking do an excellent job of removing the quaternary even when dosages as high as 1-500 are used.

Knowing that dilution will remove adsorbed quaternary, tests were made with vegetative cells of bacteria in concentrations of 100 to 200 p.p.m. After exposures of three minutes, it was impossible to make any recoveries

Table 2

A Practical Test Showing Effect of Excessive Accumulation of Organic Matter in Wash Water on the Efficiency of a Q.A.C.

Sampling	*Wash Tank*	*Rinse Tank*	*Sanitizing Tank*
At Start	110,000	6,000	0
After 100 Glasses	15,000,000	190,000	0
After 200 Glasses	18,000,000	900,000	0
After 300 Glasses	21,700,000	1,600,000	0

Rinsed Glasses		*Sanitized Glasses*	
Glass No.	*Bacterial Count*	*Bacterial Count*	*Glass No.*
10	1930	20	60
30	Over 3000	40	390
50	Over 3000	60	920
70	Over 3000	80	710
90	Over 3000	100	450
110	Over 3000	120	640
130	Over 3000	140	400
150	Over 3000	160	80
170	Over 3000	180	120
190	Over 3000	200	400
210	Over 3000	220	Over 3000
230	Over 3000	240	170
250	Over 3000	260	180
270	Over 3000	280	400
290	Over 3000	300	160
310	Over 3000	320	120

although it was demonstrated that the quaternary had been removed from the cells by checking electrophoretic mobilities.

This shows that where 100 to 200 p.p.m. of an acceptable quaternary are used on vegetative cells of S. *typhosa*, *Escherichia coli*, and M. *pyogenes aureus*, death results and no bacteriostasis is demonstrated.

Mallmann, Kivela and Turney (8) in a practical field study showed that, where 200 p.p.m. of an acceptable quaternary were used in sanitizing beverage glasses, counts under a hundred were obtained without difficulty. Neutralizers were used so that no marked bacteriostasis was involved.

Klein and Kardon (9) also found that, where dosages of 1-3,000 to 1-20,000 of Zepharin and Phermerol were used, neutralization by alkyl sulfate failed to show bacteriostasis for M. *pyogenes aureus*, *E. coli*, *Shigela paradysenteriae* and S. *schotmuelleri*.

It would appear from the literature that quaternary ammonium compounds are bacteriostatic in weak solutions and that they are germicidal in dilutions of 100 to 200 p.p.m. Thus it appears safe to state that acceptable quaternaries in concentrations of 200 p.p.m. are acceptable sanitizers providing the diluting medium does not contain any neutralizing substances sufficient to reduce the active quaternary to a sub-lethal dose.

Very frequently, field tests are made of quaternaries by sanitarians and others interested in dish sanitization, and very unsatisfactory results are obtained. Although it appears that the product is used correctly by the operator, other factors enter that result in the neutralization of the sanitizer. For example, Mallmann and Kahler (10) conducted a survey of restaurants in which a detergent-sanitizer was used for hand dish washing. Upon checking the dishes as they left the dishwater 79 per cent were found acceptable. Five of the restaurants showed acceptable dishes at all testings. Three gaves unacceptable dishes at all testings. In laboratory tests this detergent-sanitizer gave very satisfactory results. Although the restaurants showed an improvement, still the end result of 79 per cent acceptable dishes was unsatisfactory. It is true that undoubtedly in some of the restaurants the detergent-sanitizer was used incorrectly, however, if the product were working correctly a much better result should have been obtained. Was the poor showing due to other factors which rendered the sanitizing agent ineffective?

To determine the effect of some of the possible interferences, a series of studies was made. First a study was made of an acceptable quaternary under unfavorable and insanitary conditions. A three tank system was used. The tanks and brushes were very dirty. The tanks were filled with clean water but no attempt was made to clean either the brushes or the surfaces of the tanks. In the first tank was placed a detergent-sanitizer containing an alkyl dimethyl ammonium chloride in a dosage of 50 p.p.m. of the sanitizer. The second tank served as a fresh water rinse and the third tank received 200 p.p.m. of the sanitizer alone.

The washing and rinsing was done by the laboratorian assigned to this study. Every tenth glass was swabbed. The swab was placed in 10 ml. of Difco neutralizing buffer solution. Each container was shaken immediately to dislodge the quaternary from the organisms and to eliminate any further germicidal activity for the sanitizer. The results are reported in Table 1. Even though a quaternary was present in the wash tank there were still 144,000 bacteria per ml. in the water at the start of the experiment. This count increased during the wash period, until, after 400 glasses had been washed, the count reached 102,000,000 bacteria per ml. The rinse tank count increased as bacteria were carried over from the wash tank until the population finally reached 1,360,000 per ml. The sanitizing tank showed approximately 1,000 per ml. with a slight rise at the end of the experiment. The rinsed glasses, as would be expected, had swab counts in excess of 3,000 bacteria. After passing through the sanitizing solution the count ranged from 10 to 2,140 with 11 out of 21 glasses showing counts in excess of 100.

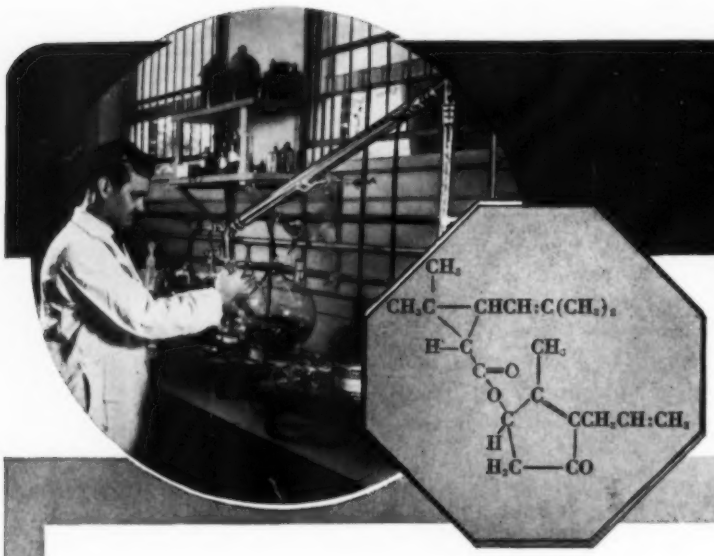
These data show that, even though a quaternary was used in both the wash and final rinse tanks, and though the washing was done by a

Table 3

A Practical Test Showing the Efficiency of Quaternaries in Sanitizing Glasses Under Satisfactory Conditions

Sampling	*Wash Tank*	*Rinse Tank*	*Sanitizing Tank*
At Start	0	0	0
After 100 Glasses	0	0	0
After 200 Glasses	1,000	0	0
After 300 Glasses	0	0	0

Rinsed Glasses		*Sanitized Glasses*	
Glass No.	*Bacterial Count*	*Glass No.*	*Bacterial Count*
10	120	20	0
30	80	40	0
50	40	60	0
70	0	80	0
90	450	100	0
110	40	120	0
130	20	140	0
150	20	160	0
170	0	180	40
190	20	200	10
210	0	220	0
230	10	240	0
250	20	260	0
270	30	280	10
290	0	300	0



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laboratorian, still unsatisfactory results were obtained.

A week later a second test was made in the same tavern. The experiments were conducted as before except that in this experiment an anionic detergent was used for washing and an alkyl dimethyl benzyl ammonium chloride (200 p.p.m.) was used in the final rinse. The results are presented in Table 2.

The population of the wash water rose to 21,000,000 after washing 300 glasses. The rinse water rose to 1,600,000 bacteria per ml. but the sanitizing rinse remained zero. The rinsed glasses had counts in excess of 3,000 and the sanitized glasses, with the exception of two glasses, gave counts in excess of 100. Again unsatisfactory results were obtained.

A second series of tests was made after the tanks and brushes were thoroughly cleaned prior to the experiment. The conditions simulated those found in a clean tavern. The washing was done by the same laboratorian. The set-up of detergent and sanitizer was the same as in the previous experiment. The results are presented in Table No. 3.

This time the bacterial populations in the wash, rinse and sanitizing bath were low. The lowest dilution of the wash and rinse water plated was 1-1,000 and, inasmuch as the plates were free of colonies, the counts were under 1,000 per ml. The rinsed glasses had counts under 100 except for two glasses with counts of 120 and 480 respectively. The sanitized glasses had zero counts with the exception of three glasses with counts of 10, 10 and 40 respectively.

These data show the effect of good sanitation and the need of carefully prepared equipment for the effective use of the sanitizer. In the earlier experiments (Tables 1 and 2) the quaternary was actually neutralized or adsorbed by suspended solids and grease as well as soiled surfaces of the equipment. The extremely high bacterial populations also reduced the dose per cell to sub-lethal concentrations.

These data are particularly valuable in demonstrating the need of sanitary equipment and thorough cleaning. It must be remembered that in any sanitizing process the washing operation is far more important than the type and kind of sanitizer. If dishes are cleaned and flushed with clean water, most any sanitizer in the right concentration and exposure time will give satisfactory results. If cleaning is poorly done, no sanitizer can do a satisfactory job, due to the fact that none of them have the property of penetration so that any soil containing bacteria will protect against the germicidal activity of the disinfectant.

In testing quaternary ammonium compounds or any other sanitizer, the conditions of testing should be carefully controlled so that a test can be made of the efficiency of the sanitizer without introducing variables that represent faulty operation.

It has been shown by a number of investigators that the calcium and magnesium ions will reduce the bactericidal activity of quaternary compounds. Armbruster and Ridenour (10) demonstrated that both calcium and magnesium ions caused a decrease in the germicidal activity of acceptable quaternaries. They found that "as little as 40 p.p.m. of calcium or magnesium reduced the lethal action of 35 p.p.m. of this compound (quaternary) from 99.9 per cent to 50 per cent." When tests were made with contaminated beverage glasses using 200 p.p.m. of quaternary at 100 p.p.m. calcium hardness, no significant difference was found between the hard water and the distilled water. In other words in the latter tests the amount of quaternary was great enough to satisfy the possible demand of the hard water ions and still leave enough free quaternary to kill the bacteria.

The writers have found similar effects with hard waters. For example, in testing a natural water with a hardness of approximately 600 p.p.m. the minimum killing dose fell from 1-10,000 for distilled water to 1-2,800 for *E. typhosa*. This, however, was a shipped water.

A series of field studies was made to determine the effect of hardness on the sanitizing value of quaternaries. Two locations were selected, one tavern with a lime-soda softened water with a hardness of 85 p.p.m. and another with a water hardness of approximately 450 p.p.m. Tests were made in the same manner as those described for checking the effect of insanitary equipment. The results for a water of 85 p.p.m. hardness are reported in Table 4. This tavern was operated in a sanitary manner. The re-

(*Turn to Page* 147)

Table 4

A Practical Test Showing Efficiency of a Quaternary Ammonium Compound When Used in Lime-Soda Softened Water of 85 p.p.m. Total Hardness

Sampling	*Wash Tank*	*Rinse Tank*	*Sanitizing Tank*
At Start	84,000	3,300	0
After 100 Glasses	98,000	4,100	0
After 200 Glasses	111,000	6,800	0
After 300 Glasses	243,000	6,000	0

Rinsed Glasses		*Sanitized Glasses*	
Glass No.	*Bacterial Count*	*Glass No.*	*Bacterial Count*
10	590	20	0
30	1100	40	0
50	120	60	20
70	120	80	0
90	1550	100	0
110	1630	120	30
130	250	140	0
150	400	160	10
170	90	180	0
190	100	200	0
210	190	220	10
230	1300	240	0
250	200	260	0
270	710	280	20
290	80	300	0

GLOSS, And Its Evaluation In Floor Waxes

By Daniel Smith *

Interchemical Corporation Research Laboratories

WAXES are employed for the contribution which they make to the appearance of a floor or its covering, in addition to the protection which they can afford. For industrial control purposes, it is essential that routine objective methods be made available for the evaluation, specification, and control of the gloss which waxes are able to produce. Many investigations have been made in the realm of gloss, but the results of most of these have been obtained without adequate consideration of the psychology of gloss evaluation. Any physical method for gloss evaluation should give results which agree with the subjective response of an average normal observer under specified conditions. The evaluation and specification of gloss, therefore, require investigation into both psychology and physics if satisfactory methods are to be developed.

Problem of Gloss Not Simple

THE problem from a psychological point of view is not so simple as mere physical descriptions of the reflectance from glossy and matte surfaces might imply. An individual does not consider the reflectance from a surface as a function of an angle when he looks at it, but rather he gets an impression which he is most frequently at a loss to explain, but which he does not hesitate to evaluate.

The vase in figure 1 appears glossy, yet it could be a reproduction made from a dull print of that subject. We rely entirely on our past experience to conclude that it is glossy.

What is there about our experience with glossy objects which makes us conclude as we do? *First*, we see highlights. But these alone are not sufficient to reach a correct and well-founded conclusion because the highlights in the figure merely represent differences in reflectance over the surface. *Second*, the highlights come at reasonable positions with respect to the curvature of the subject. We know, even if only intuitively, that the surface at a curve presents a rapidly changing angle, and we have learned that when a surface is glossy the amount of light reflected changes very rapidly as the angle between the surface and the observer goes through the specular angle. And even this is not enough to reach an unequivocal conclusion that the subject is glossy, because, as in figure 1, the variations in reflectance over a matte surface could have been determined very precisely to stimulate the same response as that from a glossy object.

The conclusions we have reached so far could have been formulated using monocular vision. What more can we learn if binocular vision is employed for observations, with particular attention paid to those characteristics which become discernible for the first time? We find that each eye sees a different distribution of highlights as indicated in figures 1 and 2. This difference in highlight distribution between the two aspects of the object as seen in binocular vision is of primary importance. From it can be drawn additional conclusions regarding the basic and fundamental appearance attributes of a glossy surface, and the pertinent physical characteristics of the surfaces which produce the requisite stimulus.

The production of a highlight depends upon the specular reflectance characteristics of the surface and the fact that for any position of a small source of illumination only selected elementary areas of the subject present the correct angle to both the source and eye for the latter to receive light which is reflected from the subject at the angle of specular reflection.

The use of binocular vision is not a unique way to arrive at conclusive decisions that a surface is glossy. The essential feature of binocular vision is that two angles of observation are involved, and if at least two separate observations are made successively from different angles, the same conclusive gloss information will be obtained.

The physics necessary for an insight into what happens when light is reflected from glossy and dull surfaces is quite simple, and the under-

Figure 1

Figure 2

* Before Chemical Specialties Manufacturers Assn., Washington, D. C., Dec. 5-6, 1949.

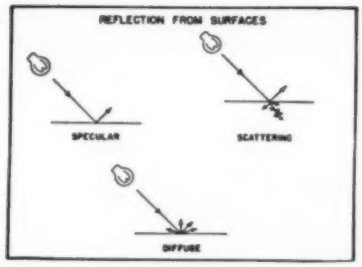


Figure 3

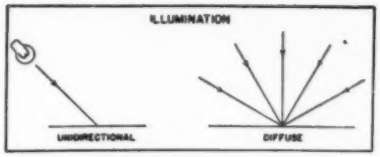


Figure 4

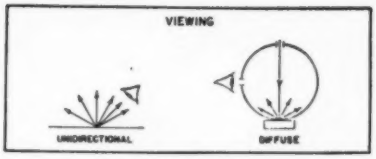
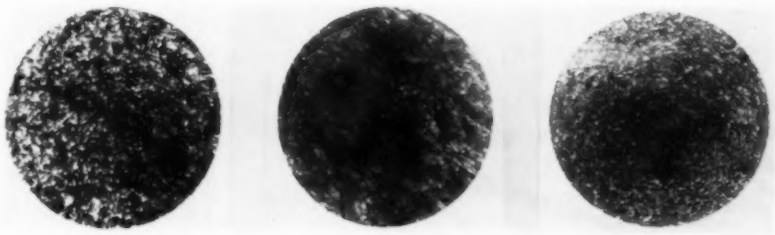


Figure 5



Linoleum Vinyl Rubber

Figure 6

standing which will result from a brief analysis will be worth while. If a beam of light is incident on a surface, it can be reflected in any or all of three ways. The light, as shown in figure 3, may all be reflected in the direction of specular reflection, or it may be diffused at the surface, or scattered within the medium to give a reflected beam which is spread over a wide angular range. Now, let us investigate the influence of the mode of illumination on the appearance of a subject. The extreme types of illumination, see figure 4, are the unidirectional and the diffuse; the former representing the case wherein all of the light incident upon a surface comes from one direction only, the latter being the case wherein light is incident upon a surface in equal amounts from all possible directions. Most practical conditions of illumination are composites of these extremes.

If a specular reflector is illuminated unidirectionally, by definition it follows that all of the light will be reflected in the single direction corresponding to that of specular reflection for the angle of incidence of the unidirectional beam. This same surface, if illuminated perfectly diffusely (equally from all directions), will reflect light equally in all directions. But this equal reflectance in all directions represents the appearance of a diffuse reflector. We are, therefore, forced to conclude, and correctly, that with perfectly diffuse illumination even the extremes of gloss surfaces are indistinguishable.

Similarily, the reflecting surface may be viewed from one direction or it may be viewed diffusely. (Figure 5.) Of course, visual observations are ordinarily made unidirectionally, but either visual or photoelectric observations may be made by having recourse to an integrating sphere.

Factors Affecting Gloss

IT is now apparent that the gloss appearance of a surface depends not only upon the surface itself but also upon the illuminating and viewing conditions. For a hard floor covering, it is desirable to control the appearance by changing the surface without altering either the illuminating or the viewing conditions.

In figure 6 are photomicrographs of several hard floor coverings showing their relatively rough surface structures. If the microscopic pores of these surfaces are even only partially filled in, their gloss will be substantially increased.

The demonstration of subtle differences in surface characteristics may be simplified by the use of a slit microscope as in figure 7. One microscope is used to project a sharp image of a narrow slit onto the surface being studied. The surface is inclined at 45° to the axis of this illuminating microscope, and a second microscope at 90° from the first is used to examine the structure of the slit illumination. Essentially this method simulates sectioning of the surface at 45°. A polished glass surface produces a sharp continuous slit image, whereas a ground glass surface produces a diffuse and discontinuous image, as demonstrated in figure 8.

Hard floor coverings have

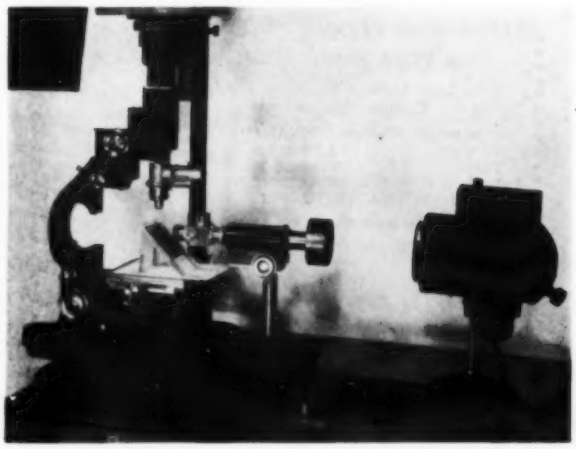


Figure 7

Figure 8
Polished Glass

Ground Glass

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and Formulations

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in the long run!

Use only the original quaternary ammonium germicide

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BAKERIES
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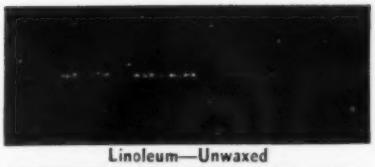
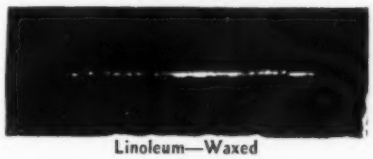
structures which are between the two glass surfaces just considered. A specimen of linoleum has been photomicrographed by the slit microscope before and after application of a non-rub wax. The identical areas are considered in figure 9, where the subtle differences can be seen.



Linoleum—Unwaxed



Linoleum—Waxed

Figure 9

An Objective Gloss Test Method

SO much for the psychology of gloss evaluation and the physics relating surface structure to gloss. Now let us consider some of the requirements of an objective gloss test method which might be applicable for the evaluation and specification of floor waxes. It has been adequately demonstrated that any useful gloss test method should incorporate the following characteristics: 1) The source of illumination should subtend a small solid angle at the test surface, 2) The measuring device should accept light reflected by the test surface only over a small solid angle, and 3) At least two measurements must be made, either with different positions of the source of illumination, different positions of the measuring device, or different orientations of the test surface. These variations in illuminating and viewing angles are demonstrated in figure 10.

The design and construction of gloss measuring instruments is worthy of separate lengthy consideration which is outside the scope of the present paper. However, the selection of geometric conditions of measurement and preparation of test panels for the rating of waxes will be considered briefly.

The objective rating of waxes on the basis of their ability to increase the gloss of the surfaces to which they are applied is an obviously desirable goal. To a large extent waxes are used because they can and do increase the gloss of surfaces.

Physical Test Requirements

ANY attempt to establish a useful objective method of specification must be preceded by careful consideration of the factors which influence the psychological response and the physical factors which influence the efficiency of the wax as a "gloss agent." The pertinent psychological factors have already been discussed, and now the physical requirements of a useful test method will be considered. In general, a test method is ideal if it simulates actual intended end use in every detail. This is not always possible, but developmental difficulty alone is insufficient reason for abandoning a desirable procedure in favor of one which is less desirable but simpler. This may be done at the expense of loss of correlation between the test method and the product in end use, which vitiates the total usefulness of the test. This philosophy would indicate that wax tests should therefore be made on hard floor coverings, applied by one or more of the normal means of application. Certainly reproducibility of results is a primary requirement of any test method. Therefore, in a wax test it might become necessary to standardize on the type or types of floor covering to be treated for purposes of evaluating the wax efficiency. This might present considerable difficulty in itself, and yet substitution of the hard floor covering by a more easily reproducible surface with its different absorption characteristics and micro-structure may lead to completely irrelevant results.

The angles at which measurements are made should bear some relation to the conditions under which waxed floors are commonly observed. Measurements made at near grazing angles of view may show differences between waxes which may not be otherwise discernible, but few observations are made on flooring surfaces at grazing angles. Most observations are made at angles between normal and about 75° to the normal, and possibly these two angles might provide the basis for measurements.

No numerical rating of efficiency can be made on the basis of the difference in gloss between the waxed and unwaxed test surfaces. The correlation between equal gloss increments and equal scale increments on any instrument is totally unknown. One obvious way of circumventing this difficulty is to standardize on a test surface which has a carefully controlled and specified gloss before waxing, and to specify the wax on the basis of the gloss of the surface after waxing.

To sum up then, a possible test procedure for specifying the efficiency of waxes as "gloss agents" would specify the angular apertures of the source and receiver, the angle or angles of illumination and viewing, the standard

(*Turn to Page* 145)

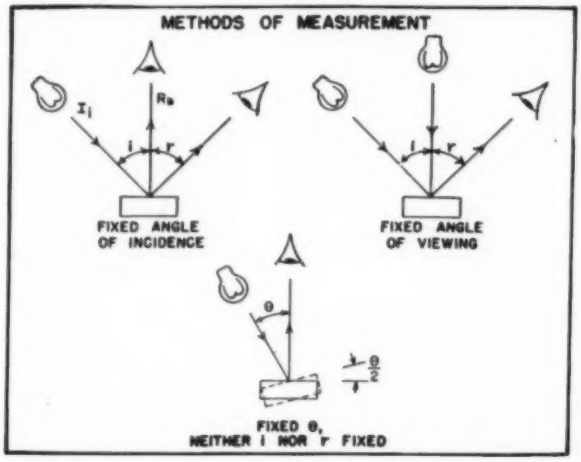


Figure 10

Toxicity of a Synthetic Pyrethrin

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S. B. Penick and Co.

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Hunter College

SINCE the first announcement about a year ago by the Bureau of Entomology and Plant Quarantine of the successful synthesis of a pyrethrin-like material by Schecter, Green and La Forge, numerous investigators have been checking, not only on the insecticidal efficacy of the compound, but on the toxicity hazards presented by the new material as well. The synthetic pyrethrin referred to in this paper is the completely synthetic allyl homolog of cinerin I, although a shorter name, devinylpyrethrin I, is suggested as being equally precise and much more convenient. This is the same compound the insecticidal potency of which was reported on by Stoddard and Dove (1949) and which they differentiate carefully from the "partially synthetic pyrethrin-like compound." This latter compound contains the natural *d-trans*-chrysanthemum monocarboxylic acid, and was referred to in Gersdorff's (1949) paper as the compound he found most toxic to houseflies.

The common use of the term pyrethrin in both the scientific and the commercial literature is as much generic as it is specific; therefore, any new compound of the genus may be adequately defined by indicating the particular pyrethrin referred to. The synthetic devinylpyrethrin I (DVPy I) is the optically inactive form of pyrethrin I with the side chain shortened to the extent of one vinyl group.

The name is derived by the use of accepted terminology of the science of chemistry. Using the same system, the partially synthetic compound would be *d-trans*-devinylpyrethrin I, and the synthetic alcohol portion of the ester would be devinylpyrethrolone.

The material used in these studies was a technical grade of devinylpyrethrin (DVPy)[1]. In the Peet-Grady chamber it gave the same knockdown and kill of houseflies as an authentic sample prepared in the laboratory of the Bureau of Entomology and Plant Quarantine.

Since commercial quantities are already available or will be available within a short time, it is urgent to learn as much as possible about the toxicological effect of DVPy (pronounced dee-vee-pie) on warm-blooded animals. Bishopp has already reported[2] that investigators in the U. S. Department of Agriculture have found the acute toxicity of DVPy to rats to be less than natural pyrethrins.

Recent papers on the pharmacology of insecticides have emphasized chronic toxicity even more than the acute toxicity. Therefore studies on the chronic effects of DVPy on white rats were started as soon as samples which were representative of commercial production were available.

Table 1. Growth of White Rats Fed 0.2 Per Cent of a Synthetic Pyrethrin (DVPy) in Their Diet Compared with Control Rats

Females	*No. of Rats*	*Average Weight* *Aug. 19*	*Sept. 30*	*Dec. 12*	*Jan. 16, 1950*
Controls	2	97	189	251	283
Fed DVPy	3	100	179	257	289
Males					
Controls	2	113	285	392	408
Fed DVPy	3	112	265	379	401

Chronic Feeding Tests

CHRONIC feeding of DVPy was started on August 19, 1949. Six rats (3 males and 3 females) have been maintained on a diet of prepared dog food with 0.2 per cent of DVPy mixed in. Since the rats ate about 10 per cent of their body weight per day, the dosage approximates 200 mg. per kg. per day. In addition to the regular diet both treated and control rats were fed carrots twice a week.

The feeding experiments are being continued, but after 24 weeks of being fed relatively high daily doses of DVPy, there have been no deaths and

Chronic toxicity tests on white rats show devinylpyrethrin (DVPy) to be non-toxic when used as a spray or incorporated with food

[1] Received from Carbide and Carbon Chemical Corporation under the label "Allyl Cinerin "B", Technical Grade."
[2] Tampa Meeting, American Association of Economic Entomology, December 16, 1949.

no outward signs of injury. Treated and control rats weigh about the same, and all female rats have given birth to at least two normal litters. Development records are shown in Table I.

The DVPy diet was continued straight through even after the birth of the young, with a supplement of milk for one week. As soon as the young rats were able to take solid food, their diet was 0.2 per cent DVPy, the same as the adult rats. The growth of the second generation rats was about the same as controls. There were 44 young rats in seven litters from fed mothers. The average weight of these rats, 40 to 42 days old, was 93 grams against 98 grams for controls. There were 21 young rats in 4 control litters.

Aerosol Inhalation Tests

CHRONIC aerosol inhalation tests were started September 6, 1949, using 20 rats (11 males and 9 females). Such tests are believed to be especially significant, since the data presented by Fales[3] and our own unpublished data indicate that DVPy will be especially useful in aerosol insecticide formulations.

The following aerosol formula was prepared for the tests:

	Per Cent
Devinylpyrethrin (DVPy)	1
Petroleum Distillate (Bayol-D)	9
Freon 11	45
Freon 12	45

The concentration of DVPy is 2 to 2.5 times greater than the quantity of natural pyrethrins used in the best quality aerosol bombs offered for sale to the public during the past two years. The DVPy was used at a high concentration to make a severe test, but as a practical insecticide it may be used at about the same concentration as natural pyrethrins.

The aerosol dosage, of 800 grams per 1000 cubic feet, is 100 to 200 times that which would normally be used in the household and the rats are exposed 30 minutes a day, six days a week. The dosage is calculated at 800 grams per 1000 cubic feet, but actually it is introduced in two shots. Half the amount is sprayed into the 12 cubic foot chamber at the beginning of the exposure period and the remaining portion 15 minutes later. The rats are exposed in their regular cages along with their regular diet. In such a treatment the rats not only inhale some of the chemical but the eyes, ears, and other sensitive parts of the body are partially wetted with DVPy. The living quarters are contaminated with residues and the feet are in almost continuous contact with the insecticide. Appreciable quantities of DVPy are taken orally as the rats clean themselves and also because their regular diet is contaminated with insecticide residues many times greater than would be obtained in normal usage.

The tests are continuing, but after 22 weeks of exposure there have been no deaths among the treated rats. There are no outward indications of injury or irritation, and the size of the treated rats is essentially the same as the control rats. The growth records are shown in Table 2. During the experiment all female rats have been mated, and each one has given birth to two normal litters.

A total of 42 of the new-born rats have been included in the aerosol inhalation tests starting when they were 1 or 2 days old. They were subjected to the same chronic exposure schedule which was used for the adult rats. Out of this group of 42 rats, only 3 died, and 2 of these were eaten by the adult rat and one was found crushed. Seventeen rats of the earlier litters are now 12 to 16 weeks old and are full grown rats which have shown the same rate of growth as the control groups. See Table 3. These rats have been in contact with excessive DVPy residues since the day they were born, and as soon as they were old enough to take solid food it contained the DVPy residue. There was no sign of irritation even during first week when the new-born rats were hairless.

The growth of the new-born rats which were sprayed with the DVPy aerosol was normal. The growth records on a sprayed litter and a control litter which were born the same day are tabulated in Table 3. The young rats in the control litter were smaller than the sprayed litter at 40 days because there were eleven in the control litter and nine in the sprayed. After 40 days with both groups on the regular diet the growth was essentially the same.

Table 2. Growth of White Rats Sprayed with a 1.0 Per Cent DVPy Aerosol Compared with Controls

Females	*No. of Rats*	*Average Weight* Sept. 6	Sept. 30	Dec. 12	Jan. 16, 1950
Controls	3	95	170	242	267
Sprayed	6	95	165	252	275
Sprayed	3	167	213	252	261
Males					
Controls	3	93	210	359	394
Controls	3	207	292	418	449
Sprayed	8	127	219	386	416
Sprayed	3	212	305	439	472

Pathological Examinations

DURING the DVPy inhalation experiments on adult rats, 4 untreated controls and 8 experimental rats were sacrificed after 4 weeks and

Table 3. Growth of a Litter of Nine White Rats Sprayed with DVPy Aerosol Compared with a Control Litter of Eleven

Sprayed	*No. of Rats*	*Weight in Grams* 40 *days*	51 *days*	65 *days*	79 *days*
Females	6	96	138	167	196
Males	3	112	174	238	285
Controls					
Females	6	88	137	167	196
Males	5	83	141	203	231

[3] Washington Meeting, Chemical Specialties Manufacturers' Association, December 6, 1949.

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7 weeks exposure. Of the young rats, sprayed with DVPy aerosol, 8 experimental and 8 controls of the same age were sacrificed after 5 weeks. After 12 weeks, more experimental rats were examined, 3 controls, 4 sprayed and 5 which had been fed 0.2 per cent DVPy in the diet. In a total of 25 exposed rats there was no visible damage or gross pathology in any of the internal organs.

Microscopic examination of the organs was made, with special emphasis on possible injury to the lungs. In all of the treated young rats the lungs as well as all other internal organs were entirely normal with the exception of a hyperplastic thyroid in one rat. Of the older rats the lung parenchyma was in all cases normal and the very occasional thickened walls of arteries could not be related to the DVPy areosol treatment, since such were also found in the untreated controls. Other organs were normal. In none of the experimental animals was any abnormality found, which could be correlated with the insecticide treatments.

Summary

A SYNTHETIC pyrethrin also called the allyl homolog of cinerin I was more conveniently named devinylpyrethrin (DVPy).

DVPy fed to the extent of 0.2 per cent in their diet had no noticeable harmful effect on rats or their offspring over a period of 24 weeks, and at that time control and experimental rats were approximately the same size.

Inhalation of 1 per cent DVPy aerosol spray in large amounts did no apparent damage to rats during 22 weeks exposure, 30 minutes per day, 6 days per week. New-born rats were subjected to the treatment. The rate of growth of the sprayed young was the same as the control group.

A total of 112 rats have been fed, or sprayed with, DVPy in these experiments.

Examination of the internal organs of sacrificed rats showed no gross pathology. Microscopic examination of the organs showed no abnormalities which could be correlated with the application of DVPy.

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Floating Soaps

(*From Page* 44)

(39). In his method, sodium bicarbonate is thoroughly mixed into a soap containing an acid. The reaction between the carbonate and the acid causes sufficient carbon dioxide to be generated to yield a floating soap.

The third general group of methods for making floating soaps depends on the inclusion of light weight material (40). As far back as 1904, it was suggested (41) that resin, wax or the like be stirred with caustic lye until a crumbly granular mass is produced. This material was then mixed with a hot soap paste to give a product that floated on water. Some years later, another worker (42) described a process whereby dry, powdered, milled soap is mixed with a lower alcohol; the mixture being pressed to form a floating soap cake. In a somewhat similar process (43), curd or toilet soap is crumbled up, dried and moistened with oil or water. The mass is then kneaded, molded and dried to yield a floating soap.

The fourth classification encompasses methods for inserting or otherwise attaching hollow bodies, cork or similar materials into soap to make it float. The older literature (3) affords a number of examples of such methods. Surprising as it may seem, however, the modern patent literature also provides illustrations of such methods. In one very recent instance, Gennusa (44) claimed that a cake of soap can be made to float by inserting a hollow plastic tube into the cake with the ends extending beyond the cake of soap. The ends are then sealed to make the tube airtight, provide buoyancy and serve as a holder for the soap.

Quite ingenious is the method developed by Eagan (45), which does not depend upon any agent other than the soap itself. In this process, blank bars of milled soap are stamped in a die fitted with thin rods which project from each side toward the center of the die. The cavities which are left on withdrawal of the rods are sealed off by crimping together the edges of the soap cake. The air thus trapped in the cavities causes the soap to float.

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Gloss Testing

(*From Page* 137)

for instrument calibration, the test surface to be employed, the method for applying the wax to the test surface, and an arithmetical procedure for obtaining a numerical index from the data obtained by the measurements.

House Fly Tolerance

(*From Page* 125)

susceptible wild strains. This, of course, would be possible only if done before the entire fly population acquired a high degree of tolerance. Data obtained in a field survey, to be discussed later, may indicate this opportunity is rapidly passing if not gone. There is evidence of tolerance reduction on Farm A, as shown in table 2. The reduction in the LD-50 value of DDT on flies from Farm A could not have taken place if DDT was so widely used that there were no susceptible strains available for cross breeding.

Inheritance

THE exact mode of inheritance of resistance characters in flies is unknown; however, in the light of some of the data previously discussed on the acquisition and retention of tolerance for DDT or methoxychlor and in consideration of data presented on crosses between resistant and susceptible strains, figs. 6 and 7, tolerance might

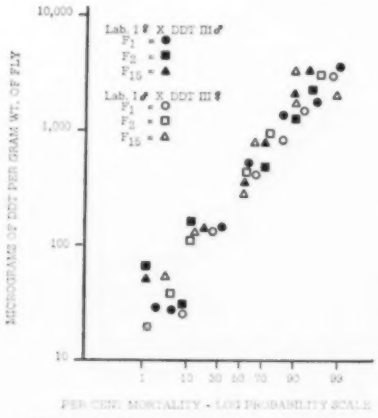

Figure 7.—Dosage mortality dispersion pattern of the F1, F2, and F15 generations from reciprocal crosses of DDT Strain III and Lab Strain I.

simply be described as a multiple-gene character which causes indifferent physiological and perhaps morphological changes.

All reciprocal crosses in this study produced F1, F2, etc. progeny with an LD-50 value intermediate between the LD-50 values of the parents. The greater slope in the dosage-mortality curve of the cross, fig. 6, indicates a wide range of susceptibility in the progeny. This heterogeneity is still evident after fifteen generations of inbreeding the cross, fig. 7. The resistance factor is carried by both the males and females of resistant strains, as is shown in the reciprocal crosses, table 3. Two other crosses of DDT-resistant strains with susceptible flies gave similar results.

There is reason to believe that resistance to toxicants by house flies may be attributed to indifferent genetical changes, ephemeral acquired tolerance, morphological alterations, or even changes in habits.

Specificity of Tolerance

THE high resistance of the DDT Strain I to DDT, table 1, contributes resistance to other insecticides. DDT Strains II and III, with lower DDT resistance, show but little resistance to other insecticides. In general, the DDT-resistant strains exhibit a significant amount of tolerance for methoxychlor. On the other hand, the highly resistant methoxychlor strain (Methoxy I) shows very little tolerance for DDT. The lindane-resistant flies show some tolerance for chlordane, dieldrin, and toxaphene, but no significant resistance to DDT. This may indicate some similarity in the physical or chemical structure in lindane, chlordane, dieldrin, and toxaphene molecules. The DDT-methoxychlor resistant strain (Multi I) has some resistance to all insecticides tested, in addition to showing the highest DDT and methoxychlor resistance of all the strains tested. The acquisition of some tolerance to piperonyl butoxide and pyrethrins (10:1 mixture) was accompanied by a resistance of almost equal magnitude to the other insecticides tested. The piperonyl butoxide-pyrethrins resistant strain (Pyro I) apparently possesses a non-specific type of resistance. No significant amount of resistance was acquired by the Lab

TABLE 3.

LD-50 values of DDT on males and females of reciprocal crosses of Lab I and DDT III fly strains, expressed in micrograms per gram weight of fly

	F1		*F2*		*F15*	
Hybrid	*Female*	*Male*	*Female*	*Male*	*Female*	*Male*
Lab I ♀ x DDT III ♂	425	301	416	316	450	326
Lab I ♂ x DDT III ♀	495	322	447	337	465	364

Strain I of flies when exposed for 21 generations to chlordane or toxaphene. Other instances of resistant strains contributing resistance to related and non-related compounds can be seen in table I.

In consideration of the information on the acquisition of tolerances, and particularly the methoxychlor strain's acquisition of tolerance for other toxicants, the authors' opinion is that these changes are quite highly but not entirely specific to a toxicant, and that they may exert considerable influence on closely related compounds. It is quite possible that the high degree of selection in intensive laboratory inbreeding has produced a strain of flies with highly specialized physiological characters which may be concerned with detoxification of toxicants or possibly the elimination of susceptible physiological processes. Thus, a para-oxon-resistant fly may have a structurally different cholinesterase or may need a greater quantity of paraoxon to inhibit its greater production

Response to Insecticides

DDT strains possessing a low degree of resistance to DDT (10 to 40 times normal) have been observed to have a faster knockdown rate than susceptible laboratory strains when exposed briefly to DDT-treated panels. Some strains like DDT Strain II and several others collected in the field when exposed to a dosage sufficient to give a 100 per cent kill with the Lab Strain I exhibited up to 85 per cent recovery following a practically complete knockdown within 2½ hours after treatment. This phenomenon immediately suggests that the fly detoxifies or metabolizes the DDT quite rapidly. In fact, James Sternburg, University of Illinois, (unpublished data) working with our methoxychlor-DDT-resistant strain (Multi I) has apparently show that these flies are able almost immediately to degrade absorbed DDT into DDE (2,2'-bis(para-chlorophenyl-1,1-dichloroethylene), whereas chemical analysis of Lab Strain I of flies has shown no evidence of any ability to break down DDT in the body. The increase in sensitivity to knockdown and high percentage recovery may help explain why flies that have little resistance, can survive in premises treated with DDT. When house flies attain high resistance, such as that exhibited by our DDT Strain I, there is little or no indication of knockdown.

TABLE 4.

Percentage of farms with flies showing various degrees of DDT resistance in terms of the Lab Strain I (N).

	Relative degree of resistance				
N	4-8*N*	9-12*N*	13-20*N*	21-30*N*	31-60*N*
12.8%	20.2%	13.8%	14.9%	11.7%	26.6%

Fly resistance to DDT is not all chemical in nature. Numerous observations and fly counts within treated premises made during the past several years have revealed instances where strains of flies have defeated DDT through a change in habit rather than entirely through the development of resistance. On some properties all flies were found resting on the lower untreated portions of the barns and upon the animals instead of on the ceilings and high places. In another case a strain seemed to have developed a stationary resting habit. Instead of walking here and there all over the barn surfaces, they would alight and remain in one spot, very much like stable flies. The LD-50 values for DDT on stable flies, *Stomoxys calcitrans* L., have remained near 9.8 micrograms per gram weight of flies from 1945 to 1949. However, one must not lose sight of the fact that the stable fly does not have as great a progeny potential as does the house fly.

There are undoubtedly an endless array of characteristics that could be selected and developed to make flies more difficult to control by residual applications of insecticides.

Survey on Illinois Farms

SECOND generation house flies from samples collected on 94 Illinois farms were treated topically with DDT. The results (table 4) give some indication of the extent of DDT resistance among flies on Illinois farms. These samples were taken from widely separated areas and should represent the fly situation in the state quite accurately. The data in table 4 reveal the presence of a rather heterogeneous population with an overall mean resistance of about 15 times normal (Lab Strain I). Only 12.8 per cent were as susceptible as the laboratory strain and 26.6 were between 31 and 60 times as resistant as the laboratory strain. There was some correlation of resistance with the number of years that DDT has been used on the farms, but at the same time resistant flies were present on farms that had never used DDT. The explanation is simply that the spread of resistance is limited only by the flight range of the fly, which may extend over both treated and untreated premises. The levels of resistance found on Illinois farms are quite alarming and call for clear thinking in the recommendation of control measures. There is no indication that the DDT resistance exhibited in these wild strains has contributed any real resistance to chlordane, lindane, dieldrin, or pyrenone. Evidence of methoxychlor tolerance appeared in August, 1949.

Certainly the strains showing low resistance to DDT found on Illinois farms cannot exhibit the variability in adaptations to other compounds that was exhibited by the highly inbred laboratory strains. These characters which contribute resistance to other toxicants (except methoxychlor) have not been intensified sufficiently in Illinois field strains to make control difficult with other insecticides. This does not mean that other kinds of resistance will not be developed in the field, but merely that it will probably be slow to materialize. However, information obtained in this study suggests that resistance to new insecticides might be acquired in less time by wild strains of flies highly resistant to DDT than by those susceptible to DDT.

Conclusions

1. Intensive selection and inbreeding resulting from exposure of adults and larvae to toxicants produced

strains of flies showing at least some degree of tolerance for all chemicals tested.

2. Generally, the acquisition of tolerance is slow during the first several generations and then increases rapidly when resistance becomes definitely established.

3. Flies highly resistant to one toxicant become resistant to others more readily than do susceptible strains.

4. Under the pressure of repeated exposure to some insecticides, resistance of flies to the insecticide may rise to a level where the species can be maintained in a heavily treated environment.

5. If no outbreeding is permitted, house fly strains of low or high resistance to DDT will in the complete absence of DDT tend to retain their resistance at a constant level for as many as thirty generations.

6. Strains of flies highly resistant to one insecticide usually show a noticeable tolerance for other insecticides.

7. Some toxicants do not produce tolerance changes as readily as others.

8. A strain of house flies showing a moderate level of tolerance for most materials tested was produced by exposing the larvae and adults of Methoxy Strain I to a mixture of chlorinated hydrocarbons.

9. To retard the development of resistance in the field, residual deposits of chemical for the control of adult flies should be applied in a manner that will not contaminate fly-breeding media. If larvacides are to be applied they should not be chemically related to the residual chemical.

10. Resistance inheritance factors are carried by both sexes. Crosses result in physiological blends of resistant characters which, in the absence of DDT, persist through as many as fifteen generations of inbreeding without measurable changes.

11. House fly resistance to DDT on Illinois farms has attained sufficient magnitude to suggest the use of alternate materials.

12. More vigilance is needed in determining the onset of resistance to DDT and other insecticides. Recommendations should be changed before fly tolerance to any toxicant reaches an alarming level.

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Quaternary Compounds

(*From Page* 131)

sults show that the wash waters started with a count of 84,000 and ended with 300 glasses at 243,000 per ml. The rinse water increased gradually to 6,000 per ml. The sanitizing rinse was always negative. The rinsed glasses with the exception of two glasses gave counts in excess of 100. The sanitized glasses were all under 100 with 10 glasses out of 15 showing zero counts. The results were very satisfactory.

The results for the tavern with a water hardness of 450 p.p.m. are shown in Table 3. It will be noted that the results were equally as good as those obtained in the tavern with the water of 85 p.p.m. hardness. As far as the end result is concerned, the sanitizing values were the same in both taverns. It is quite possible that the capacity of the sanitizer in the hard water is less than that in the softened water.

The senior author (11) recommended in 1947 that 100 glasses can be safely sanitized with one gallon of sanitizer solution containing 200 p.p.m. of either an acceptable quaternary or hypochlorite. This provides a good safety factor. This also provides the sanitarian with a yardstick to give the operator so that he may know approximately how frequently he must change his sanitizing solution.

If this plan of 100 glasses per one gallon of sanitizer were adhered to, the capacity of the quaternary would be sufficient to care for the interference of hard water ions and to supply adequate germicidal activity, except under very unusual conditions.

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A mosquitocide incense made with five per cent benzophenone was found to be as effective as the mosquitocide made with five per cent pyrethrins. However, a mixture of benzophenone and .5 per cent gamma-benzene hexachloride was only one-half as effective as a mixture of .55 per cent pyrethrins and gamma-benzene hexachloride. Crude benzophenone is more effective than the pure compound; other studies show the p,p'-DDT to be less effective than benzophenone. *Botyu-Kagaku (Sci. Insect Control)*, No. 11, 12-19, (1949).

TRADE NEWS

New Gold Seal Floor Wax

Gold Seal Co., Bismarck, N. D., is currently introducing on a national scale a new self-polishing floor wax. The company also handles Gold Seal "Glass Wax" and a wood cream preparation. The new floor wax is being distributed through 2100 F. W. Woolworth stores and 10 of the largest grocery chains. Full page advertisements in 469 newspapers with a combined circulation of 38,000,000, plus radio network advertising are supporting the product. A 25 cent sample offer is reported to have drawn more than 150,000 requests in the first few days. Each sample is said to have cost the company 37½ cents to put into the hands of the housewife. The wax is claimed to contain carnauba.

Shellac Importers Elect

Louis Gillespie, of Gillespie-Rogers-Pyatt Co., New York, was recently elected president of the United States Shellac Importers Association at the annual meeting in New York recently. Other officers elected include Herbert H. Suhr, Suhr & Budleman, Inc., vice-president; George Dockstader, Carlton & Moffat, Ltd., treasurer, and George E. Ashby, secretary.

Insecticide Exports Drop

Exports of household insecticides from the U. S. in October totaled 675,000 pounds, according to the January issue of *Chemical and Drugs*, published by the U. S. Department of Commerce. The October figure was the smallest of any month in 1949 and represents a decline of 63 per cent from the September export total. Principal countries of destination in October were the Philippines, 145,000 pounds; Venezuela, 118,000 pounds, and Canada, 94,000 pounds.

Barker Is Simoniz V.P.

W. Gardner Barker, formerly of the Pepsodent division of Lever Brothers Co., New York, was recently appointed executive vice-president of Simoniz Co., Chicago. Mr. Barker was

W. GARDNER BARKER

in charge of new products with Pepsodent.

Changes at Boyle-Midway

Hal Proskey, formerly vice-president of Michigan Chemical Co., St. Louis, Mich., and general sales manager of Lehn & Fink Products Corp., Bloomfield, N. J., was recently named director of merchandising of the newly formed drug products division of Boyle-Midway, Inc.

Also named by the company were Howard Brooks and Bruce Cardozo, who have been appointed sales managers of special products. Daniel Fellona has been appointed sales manager for the company's Philadelphia, eastern Pennsylvania and southern New Jersey areas.

Wisc. PCO Course Apr. 4-6

The fifth annual conference of pest control operators sponsored by the Wisconsin Pest Control Association will be held at the Loraine Hotel, Madison, Apr. 4-6. The department of economic entomology of the University of Wisconsin is in charge of the program. Rodents, flies and possible hazards and precautions with newer chemicals will be discussed, as will problems and activities of Wisconsin pest control operators. The annual banquet and business meeting will be held the first night of the meeting.

Dr. H. D. Pease is Dead

Dr. Herbert D. Pease, president of Pease Laboratories, Inc., New York, died Feb. 14 in New York. At one time his firm did research for the National Association of Insecticide & Disinfectant Manufacturers, now Chemical Specialties Manufacturers Association. Dr. Pease is survived by two sons, Dr. Horace B. Pease and Murray Pease.

Penick HIF Secretary

S. B. Penick of S. B. Penick & Co., New York, has been elected treasurer of the Health Information Foundation, the organization of which was announced recently. The organization has as its purpose the collecting, developing and disseminating of information for the public on available and potential facilities for the improvement and better distribution of health services.

Land Pennsalt Prod. Mgr.

Hugh C. Land, assistant to the production manager of Pennsylvania Salt Manufacturing Co., Philadelphia, was recently appointed production manager.

Syn. Pyrethrum Pat. Rights

Acquisition by U. S. Industrial Chemicals, Inc., New York, of important foreign rights under pending U. S. patents covering the synthesis and manufacture of pyrethrin-like chemicals was announced recently by William P. Marsh, Jr., president. Corresponding applications have been filed in all major foreign countries, including the United Kingdom, France, Australia, India, Brazil, Sweden, Pakistan, South Africa and many others.

U. S. patents covering the invention were filed by the U. S. Dept. of Agriculture and it was announced that the patents would be held in the public interest for unrestricted use in the U. S. The prosecution of foreign patents, however, was waived to the inventors as individuals, subject only to certain rights reserved by the fed-

eral government. U. S. Industrial Chemicals acquired those foreign rights for an undisclosed sum from Milton S. Schechter and F. B. LaForge of the U. S. Department of Agriculture, who have successfully synthesized a group of chemicals closely corresponding to one of the important constituents of natural pyrethrum, and possessing many of the unique advantages of the natural products.

Issuance of the foreign patents will enable U.S.I. to license qualified manufacturers abroad to produce those chemicals according to manufacturing specifications provided by the corporation.

Charles C. Brown Dies

Charles C. Brown, pioneer Chicago wax manufacturer, died there recently at the age of 88. He was one of the founders of Brown Manufacturing Co. in 1896, and retired from active service in the business about 10 years ago.

Insect Freight Car Damage

The problem of controlling weevil damage to freight cars loaded with grain, flour and other processed cereals was discussed at the recent 13th annual meeting in St. Louis of the National Association of Shippers Advisory Boards. The trouble is said to stem from debris that accumulates between the inner wooden lining of freight cars and their outer shell and forms a breeding medium. The problem is national in scope and prevails on all railroads. Fumigation has been tried against the confused weevil, the insect identified as causing the trouble, but it seemed to be unaffected by the fumigant, according to a speaker at the Shippers meeting. In addition to recommending that car builders redesign the inner construction of the cars to eliminate the difficulty, the group is also seeking an insecticide formula to control the weevils.

Federal Flooring Folder

A four page folder on its "Flexi-Color" rubberized color coat finish for cement, concrete, wood, linoleum and metal surfaces is now available from Federal Varnish Division, Chicago. Illustrations of possible places of application and color swatches are shown in the folder. Directions for use are also given.

Expansion is planned for the J. & L. Steel Barrel Co., Pittsburgh, young subsidiary of the Jones & Laughlin Steel Corp. Already, the J. & L. subsidiary, one of the largest producers of steel containers in the world, turns out 35,000 steel pails and 25,000 steel barrels and drums per day, plus a wide line of galvanized pails, tubs, barrels, and allied ware. Plants are located in various centers of the east, mid-west and south, mostly through purchase of going companies. J. & L. containers go chiefly for packing and shipping petroleum, paint, foods, chemical and allied specialties. Shown here are the men who built this young and growing subsidiary. F. T. Barton (seated), president of the J. & L. Steel Barrel Co. formerly president of United Steel Barrel Co., Philadelphia, and H. W. Lees, vice-president, formerly head of Draper Mfg. Co., Cleveland, both men with many years background in the steel container field.

New Bacterol Disinfectant

The development of a new, non-toxic disinfectant cleaner was announced recently by Bacterol Corp. of America, Newark, N. J. The new disinfectant and cleaner, which bears the name, "Bacterol," is said to be odorless. It is packed in consumer sizes and in gallon, five gallon and 50 gallon drums for industry.

Elects Starr, Gleissner

The election of Dr. Bruce Gleissner of American Cyanamid Co., New York, as chairman and Dr. Donald F. Starr, chief chemist of the insecticide division of S. B. Penick & Co., New York, as secretary of the insecticide section of the American Association of Economic Entomologists for the year 1950, was announced recently.

Dr. Starr is serving his second term in the office. He is also a member of the Scientific Committee of the Chemical Specialties Manufacturers Association and was recently elected vice-chairman of the committee.

Form Leedsdale Chemical

The formation of Leedsdale Chemical Co., 2330 Hollins St., Baltimore 23, to manufacture and distribute laundry and janitor supplies was announced recently.

New Black Flag Pesticide

"Black Flag Bug Killer," a new, residual type household insecticide that comes with a spray gun was announced recently by Boyle-Midway, Inc., New York. The insecticide is recommended against roaches, water bugs, moths, silver fish, spiders, centipedes and similar crawling type insects, according to the maker. The insecticide retails for 69 cents a pint or $1.19 per quart in labelled glass containers. "Jet-type" push sprayers convert these containers into spray guns.

New B&M Price List

The issuance of a new price list on its line of disinfectants, insecticides and related chemical specialties was announced recently by Baird & McGuire, Inc., Holbrook, Mass.

Photo above was taken during the 10th Eastern regional PCO Conference at the University of Massachusetts, Amherst. New methods and materials for rodent and insect control were discussed. Wood boring insects and a panel on fly control were other features.

Coming P.C.O. Meetings

Meetings of interest to pest control operators being held in the next three months as announced recently by the National Pest Control Association include:

Public Health Meetings (with emphasis on insect and rodent control), Purdue University, West Lafayette, Ind., Mar. 13-14; Indiana University, Bloomington, Mar. 15-16;

Michigan Pest Control Association, Michigan State College, East Lansing, Mar. 15-16;

Rat Control Course (3 weeks) U. S. Public Health Service, Communicable Disease Center, 605 Volunteer Bldg., Atlanta, Ga., Mar. 13-31;

Virginia Pest Control Association and Washington, D. C., Pest Control Operators (joint meeting), Washington, D. C., Mar. 24-25;

Pacific Northwest Short Course (Oregon, Washington, Idaho), Oregon State College, Corvallis, Ore., Apr. 17-19;

Fly Control (one week comprehensive course) U. S. Public Health Service, Communicable Disease Center, Atlanta, Ga., Apr. 24-28 and May 15-19.

Earlier pest control conferences were held by: Pest Control Operators of California, Inc., Santa Barbara, Feb. 12-14; Iowa Pest Control Assn., Ames, Mar. 2-3; Pennsylvania Pest Control Operators Short Course, Pennsylvania State College, State College, Pa., Mar. 2-4; New England Pest Control Assn. and Connecticut Pest Control Assn. (joint meeting), Springfield, Mass., Mar. 9.

Minn. Mining Stock Plan

More than 6,300 employees of Minnesota Mining & Manufacturing Co., St. Paul, received checks Feb. 16 totaling $293,484 as their share in the company's profits in the fourth quarter of 1949. The payment brought the year's payments of profits to $943,108.

A total of $2,440,873 has been invested in the company by employees through a recent special stock purchase plan, it was announced earlier by Herbert P. Buetow, executive vice-president. Approximately one-third of the employees eligible elected to participate in the program of purchasing the 75,000 common stock shares offered for sale on a monthly installment plan.

Ramrod Chemical Location

Ramrod Chemical Co. is now located at 549 W. Randolph St., Chicago, where two floors have been leased for the operations of this janitor supply firm.

Below: New Handi Sprayer electric unit now being distributed by James Varley & Sons., St. Louis. Sprayer is 8" high, 5" deep and 4¾" wide.

Beane McCormick V.P.

The election of A. Joynes Beane as a vice-president of McCormick & Co., Baltimore, was announced recently by Charles P. McCormick, president and chairman. Mr. Beane has been with the firm since the end of World War II, in which he served as a captain in the U. S. Army Air Forces and flew 30 combat missions as a pilot of a B-17 Flying Fortress. Prior to his election to the board of directors in 1948, Mr. Beane served two terms as chairman of McCormick's junior board of executives. He is a graduate of Western Maryland College.

Gold Seal Suit to Trial

A suit for $500,000 against Gold Seal Co., Bismarck, N. D., by its former sales manager is scheduled to go to trial May 1, Federal Judge Michael J. Igoe, of Chicago, decided recently. Gold Seal entered a motion for dismissal of the suit, in which it is contended that the company owes Earl J. Witt, of Glencoe, Ill., the money under an agreement that he was to receive two and one-half per cent of the gross sales. Judge Igoe denied the company's dismissal motion and set the trial date. Mr. Witt said he built sales from $600,000 in 1947 to $10,000,000 in 1948.

Dolge Folder on "Ban"

A circular on "Ban" cleaning compound was issued recently by C. B. Dolge Co., Westport, Conn. The folder, which is illustrated, lists six properties of the material and its uses. One-eighth cup of "Ban" to a 12-quart pail of water is the recommended use-dilution.

Kline in New Triangle Post

Herbert D. Kline is now in charge of sales and service scheduling in the new eastern sales office of Triangle Package Machinery Co., Chicago, room 351, 50 Church St., New York. Previously, for 10 years he had been in the packaging field, specializing in various types of containers and packaging applications. He recently concluded a four month training program at Triangle's Chicago plant.

Belknap on Little Board

Charles B. Belknap, of Owens-Illinois Glass Co., Toledo, was recently elected to the board of Arthur D. Little, Inc., Cambridge, Mass. He has long been active in the administration of industrial research and served as executive vice-president of Owens-Illinois from 1933 to 1941, following which he was vice-chairman of the board of his company and coordinator of research.

At the same meeting Howard J. Billings was elected treasurer, succeeding Henry C. Powning. Other officers elected at the annual meeting include: Earl P. Stevenson, president; Raymond Stevens and Leroy F. Marek vice-presidents; Frank N. Houghton, secretary and assistant treasurer; Allan L. Spurr, comptroller; Howard F. Hamacher, assistant treasurer, and Helge Holst, assistant secretary.

NPCA Technical Releases

The first and second in a series of technical releases to be issued from time to time by the National Pest Control Association, New York, appeared recently. The first dealt with the adoption as common names of insecticides of dieldrin and aldrin, made by Julius Hyman & Co., Denver. The second was a reprint of a U. S. Public Health Service release dealing with recommendations for the use and safe handling of chlordane for fly control Dr. Ralph Heal, technical director of N.P.C.A., is responsible for the issuance of the technical releases, which appear on a distinctive green paper.

Food Inspectors' Meeting

The seventh annual Dairy and Food Inspectors' and Sanitarians' School will be held at Michigan State College, East Lansing, Apr. 4-7. Details and a copy of the program are available by writing Dr. W. L. Mallmann, Department of Bacteriology and Public Health, Michigan State College, East Lansing, Mich.

New Glycol Vaporizer

Columbia Chemicals, Chicago, recently placed on the market a new type triethylene glycol vaporizer for home use. Built of stainless steel, the cylindrical holder is seven inches high and 6½ inches in diameter. The liquid containing the glycol is place in a well that has a grating over it, and the unit plugged into an electrical outlet begins vaporization. Other models have been marketed for some time for poultry house and industrial or commercial applications.

Camson to Plant Products

Plant Products Corp., Blue Point, L. I., New York, recently announced the appointment of Edwin J. Camson as sales manager and director of research. Formerly, he was for 15 years connected with Orbis Products Corp., New York, where he was in charge of insecticide sales. Mr. Camson is a graduate of Columbia University, from which he received a degree in chemical engineering in 1932.

EDWIN J. CAMSON

FDA Report Condemns Carelessness in Rodenticide Use

MANY cases of "alarmingly careless handling" in food plants of the rodenticide, sodium fluoracetate, designated in the trade as "1080," have been reported by inspectors of the Food & Drug Administration. This was pointed out in the annual report of the Food & Drug Administration, Federal Security Agency, for the year ended June 30, 1949, The report was issued recently over the signature of Paul B. Dunbar, Commissioner of Foods and Drugs.

In spite of the fact that "1080" is sold under restrictions limiting its use to trained pest control operators and public health personnel, several accidental deaths have been reported, although "so far, no injury is known to have resulted from the consumption of a food, drug or cosmetic contaminated with '1080'," the report states. The FDA recommends that all users follow closely the rules established by the National Research Council for the safe use of this rodenticide.

The report also discusses tolerances of poisonous residues on agricultural crops, pointing out that the FDA can act against suspected chronic poisons only after toxicity has been proved, that it is prepared to establish official safe tolerances if poisonous ingredients are *required* in the production of certain foodstuffs, but that these tolerances can be established only after public hearings have been held to bring out all pertinent evidence.

Reiterated in the report is the previously announced stand of the FDA that "no tolerance for DDT in milk will be set up because it is a poison that is not required in good dairy farm practice."

The development of analytical methods for the measurement of minute amounts of methoxyclor, benzene hexachloride, technical chlordane and other pesticides is mentioned in the report, as are long term feeding tests on methoxychlor, chlordane, toxaphene and several of the isomers of benzene hexachloride.

New CSMA Chairmen

New chairmen of committees of the Chemical Specialties Manufacturers Association for the coming year were announced recently by the president, L. J. Oppenheimer, as follows:

General Committees: executive, C. L. Weirich, C. B. Dolge Co., Westport, Conn.; legislative, G. S. McInerny, Boyle-Midway, Inc., New York; toxicity, C. W. Kearns, Univ. of Illinois, Urbana, Ill.; program, M. Fuld, Fuld Bros., Baltimore, Md.; associate members, J. M. Hoerner, Atlantic Refining Co., Philadelphia; eastern membership, John Powell, Powell Magazines, Inc., New York; western membership, D. W. Lynch, Velsicol Corp., Chicago; arrangements, Ira P. MacNair, MacNair-Dorland Co., New York; entertainment, J. E. Ferris, Niagara Alkali Co., New York.

Aerosol Division Committees: division chairman, H. E. Peterson, Continental Filling Corp., Danville, Ill.; scientific, E. G. Young, Kinetic Chemicals, Inc., Wilmington; program, H. R. Shepherd, Connecticut Chemical Research Corp., Bridgeport, Conn.; legislative, H. W. Moburg, Rex Research Co., Toledo, Ohio; membership, R. S. Knapp, Knapp-Monarch Co., St. Louis, Mo.

Disinfectants & Sanitizers Division Committees: division chairman, Dr. E. G. Klarmann, Lehn & Fink Products Corp., Bloomfield, N. J.; scientific, W. A. Hadfield, Pennsylvania Salt Mfg. Co., Philadelphia; disinfectants, R. S. Shumard, Monsanto Chemical Co., St. Louis, Mo.; sanitizers, R. G. Puhle, Tykor Prod. Div. of the Borden Co., New York; marketing, J. B. Dienna, Rohm & Haas Co., Philadelphia; chemical analysis, G. R. Goetchius, Rohm & Haas Co., Philadelphia; program, Dr. H. G. Lederer, R. M. Hollingshead Corp., Camden, N. J.; legislative, P. L. Robbins, Geo. B. Robbins Disinfectant Co., Cambridge, Mass.; membership, D. M. Martin, General Dyestuff Corp., New York.

Insecticide Division Committees: dvision chairman, T. Carter Parkinson, McCormick & Co., Inc., Baltimore; scientific, E. J. Campau, Standard Oil Co., Whiting, Ind.; program, J. A. Green, Standard Oil Co. (Indiana), Chicago; legislative, C. L. Fardwell, McCormick & Co., Baltimore; membership, G. W. Fiero, Esso Standard Oil Co., New York.

Soaps, Detergents and Sanitary Chemicals Division Committees: division chairman, H. W. Zussman, Alrose Chemical Co., Providence, R. I.; scientific, J. Harris, Monsanto Chemical Co., St. Louis, Mo.; program, H. W. Zussman, Alrose Chemical Co., Providence; legislative, H. Kranich, Kranich Soap Co., New York.

Waxes and Floor Finishes Division Committees: division chairman, B. S. Johnson, Franklin Research Co., Philadelphia; scientific, C. S. Kimball, Foster D. Snell, Inc., New York; marketing, M. J. Flanagan, Federal Varnish Div., Chicago; program, C. L. Weirich, C. B. Dolge Co., Westport, Conn.; legislative, G. S. McInerny, Bole-Midway, Inc., New York; membership, A. L. Sodergreen, West Disinfecting Co., New York.

CSMA Meeting Dates

The 37th annual meeting of the Chemical Specialties Manufacturers Assn. (formerly N.A.I.D.M.) will be held Monday and Tuesday, Dec. 4 and 5, at the Hotel New Yorker, New York. The 36th mid-year meeting will be held again this year at the Drake Hotel, Chicago, Monday and Tuesday, June 12 and 13.

The appointments of James M. Cottingham, Jr. (left) as director of advertising and Edward J. Samuel as director of public relations was announced recently by Stanley Home Products, Inc., Westfield, Mass. Mr. Cottingham is directing the company's first national advertising campaign and merchandise promotion. The new director of public relations has been with Stanley Home Products, Inc., for a number of years.

Chlordane Folder

A technical bulletin on "The Emulsification of Chlordane with Tritons" has been released by Rohm & Haas Co., Philadelphia. The four-page folder discusses chlordane emulsion concentrates, solvents, physical characteristics as well as the use of "Tritons" in chlordane formulations.

Fox Chemical Moves

Fox Chemical Service, Inc., recently moved from Hyattsville, Md., to Berwyn, Md. The firm has acquired an acre of industrial land with a siding on the main line of the Baltimore & Ohio Railroad at Berwyn station. In addition to compounding janitor supplies, the firm has bought storage tanks and other machinery for manufacturing sodium metasilicate. It is also starting to make detergent briquettes for dishwashing machines. A substantial increase in production of alkaline builders for industrial laundries is contemplated, according to the company's announcement.

DCAT Dinner

More than 2,000 members and guests attended the annual dinner of the Drug, Chemical and Allied Trades Section at the Waldorf Astoria, New York, on March 9th. Harold C. Green, DCAT chairman, introduced Admiral W. H. P. Blandy, president of the Health Information Foundation, as the guest speaker. Admiral Blandy discussed health protection as a major line of defense.

Pioneer Chemical Moves

Pioneer Chemical Co., Los Angeles janitor supply firm, recently moved its plant and offices to 326 E. 3rd St., Los Angeles 13. At the same time, the company announced the following officers: Murray H. Perskin, president and general sales manager; George Beaudet, sales supervisor; Fred Katz, general manager of the floor division and James J. Durkin, floor consultant. For many years Mr. Perskin has been sales manager of Pioneer, prior to which he was affiliated with S. Gumpert Co. of Ozone Park, N. Y. for 20 years as branch sales manager.

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Chemist Wanted: With at least ten years experience in formulating sanitary chemicals such as waxes, soaps, cleaners. Must have actual production know-how, and specific formulations tested and ready for use. Man who can assist us weekends will be considered. Excellent remuneration. Established Conn. concern. Address Box 145, c/o *Soap*.

Salesman Wanted: With following in Georgia, Florida or Alabama. Experience required in sanitary and janitor supplies field. Give full details in first letter. All negotiations strictly confidential. Address Box 146, c/o *Soap*.

Salesman Wanted for prominent line of liquid soap dispensers for jobbing trade. Give full details in your first letter. Address Box 147, c/o *Soap*.

Soap Development Engineer: Large soap manufacturer has fine opportunity for Chemical Engineer with experience in modern synthetic detergent plant handling sulfonation, sulfation and spray drying. Give full details of education, experience, age, and salary in first letter. Address Box 167 c/o *Soap*.

Chemical Engineer: Nationally known soap company has opening for outstanding Chemical Engineer with broad experience in modern soap processes including, spray drying, hydrogenation, milling, etc. Real opportunity for advancement. Send resume, state salary desired. Address Box 168 c/o *Soap*.

Positions Wanted

Sanitation Products Chemist: Experience investigating and developing floor cleaners, hand soaps, dishwashing compounds, bowl cleaners, process cleaners, and other products for plant in Louisville. Married. Will relocate. Address Box 148, c/o *Soap*.

Salesman: Age 39. Offers wide contacts among midwestern buyers of synthetic detergents, alkalies, chlorine and other heavy chemicals. Degree in chemistry from leading engineering school plus practical experience enables me to help solve customer technical problems. Address Box 149, c/o *Soap*.

Soapmaker & Chemist: Competent. Having long experience in making of all kinds of soaps and cleaning compounds. Experienced chemist and glycerine recovery. Can take full charge of production. Address Box 153, c/o *Soap*.

Soapmaker: 20 years experience laundry soaps, powders, spray products, all phases production, run plant or any part. Wants position with soaper where experience and training will count. Or will spend part time revamping methods, modernizing plant, cutting costs, etc. Excellent record and references. For further details write to Box 150, c/o *Soap*.

Specialty Products Chemist-Bacteriologist with new products and ideas for development. Ph.D., ten years experience insecticides, disinfectants, various chemical products. Seeks responsible position with progressive company. Address Box 151, c/o *Soap*.

Chemical Engineer: Organic Chemist, Sc.D., Ch.E., minor organic chemistry, doctorate research — photochemical chlorinations, 2 years industrial, development and research experience. Married, 27, desires development or research position, available immediately, location material. Address Box 152, c/o *Soap*.

Miscellaneous

Wanted — Manufacturer desires to buy used laboratory size soap mill and plodder. Give details and price in letter to Box 154, c/o *Soap*.

Miscellaneous

Wanted: Soap Chip Dryer complete with chilling roll unit and conveyor. Must be in good operating condition. Give full description including maker's name, age of equipment, capacity, dimensions, etc. Address Box 155, c/o *Soap*.

Specification Mixing of Dry Chemicals. Ten pounds up to bulk size packages. Reputable organization, highly experienced staff. Metropolitan New York area. Ex Warehouse or can drop ship in your name. Can furnish materials. Address Box 156, c/o *Soap*.

Representative Wanted to call on soap and sanitary chemical manufacturers. Our line includes a wide range of perfumers materials created specifically for this industry. Openings available in major territories. Exceptional Laboratory and "Front Office" cooperation. Write in complete confidence. Samuel Klein, 4 Hanover Square, New York 4, N. Y.

Salesmen or Distributors Wanted: Calling on manufacturers of cosmetics, shampoos, beauty supply houses with Veripon—an Amino Coconut Oil Condensate, pH6.8—Basis of Many of Europe's Famous Shampoos. Produced by simple admixture with water. Offers distinctive addition to cosmeticians present lines. Technical knowledge unnecessary. Verapon, Inc., 801 Second Ave., New York City.

Distributors & Jobbers Wanted: Sell new dust mop treatment, Dust Absorber. Absorbs dust — doesn't stain. Fine for dust cloths. 100% profit. S. Parlee Co., 3703 Mass. Ave., Indianapolis 18, Ind.

Wanted: Complete soap or sanitary chemical plants. Also individual items such as crutchers, plodders, mills, mixers, pressers, dryers, filling equipment, etc. R. Gelb & Sons, Inc., State Highway No. 29, Union, N. J.

Wanted: Chemicals — Alkalies —Colors—Solvents—Drugs—Oils and Foots. Soaps—Other Supplies. Chemical Service Corp., 92-06 Beaver St., New York 5. Tel.: HAnover 2-6970.

Will purchase Immediately: Pneumatic Packaging Machine, used for chips, powder, cleanser; also dry mixers, chip dryers, crutchers, and automatic soap press. Address Box 157, c/o *Soap*.

Wanted: Large engineering firm wishes to acquire several complete soap plants through purchase of (1) capital stock, (2) assets, (3) machinery and equipment, whole or in part. Personnel retained where possible, strictest confidence. Address Box 1215, 1474 Broadway, New York 18, N. Y.

For Sale

For Sale: 1 — Houchin 5-roll mill—steel rolls—for milling flake soaps — excellent condition — complete with motor $3100. Address Box 160, c/o *Soap*.

For Sale: 1—Lehman 12" Screw Plodder complete with motor—excellent condition $2250. Address Box 161, c/o *Soap*.

For Sale: Barret electrically operated portable elevator, capacity 3,000 lbs. lift height 9'-6", platform 23" x 42". Plant Equipment Company, Cincinnati 3, Ohio.

For Sale

For Sale: Small Established chemical maintenance and sanitary business including ideal 5000 sq. ft. brick factory fully equipped and operating—beautiful offices—heart of industrial center Southern California —room for expansion—modest investment—immediate profits. Address Box 158, c/o *Soap*.

For Sale: Proctor & Schwartz 3 pass flake soap dryer, with roll mill—completely rebuilt—excellent condition — $3800 buys complete unit. Address Box 159, c/o *Soap*.

For Sale: 1—Eimer & Amend Viscosimeter. 3—Double arm Sigma blades mixers. 10—Single arm mixers — all sizes. 2 — Hammer mills, heavy duty. 5—All metal weighing hoppers. 12—Steam jacketed kettles—all sizes. 4—Ribbon blenders. 4—Sifting & elevating units. 2—Motorized belt conveyors. 5—Portable stainless agitators. 1—McCormack separator. 3—Hammond 6" screw lifts. 4—250 gallon aluminum storage tanks. 1—Heavy duty steel refiner. All of the above equipment is offered rebuilt and guaranteed. Prices and details given on request. Frederick W. Huber, Inc., 268 West Broadway, New York 13, N. Y.—WAlker 5-6783.

For Sale: Two 200 gallon full jacketed Dopp Kettles with type "L" Agitator. Also other chemical equipment. Allied Steel & Equipment Co., Dept. W., Chester, New Jersey.

For Sale: 2 drums surplus perfume oil available. Ideal for para or liquid soap. Sacrifice at $1.00 per lb. Worth much more. Address Box 163, c/o *Soap*.

For Sale

For Sale: New Torsion Balances. Original export cases; model #3500; 4.5 kilo capacity, 0.25 gram sensitivity, 100 gram beam—graduated in gram units. Stainless steel pans—quick arresting. Listed at $98. Sacrifice at $45. each. Address Box 164, c/o *Soap*.

For Sale: Manufacturer has 3000 lbs. Atlas Product G.2000-C surplus to requirements at 63c per lb. Address Box 165, c/o *Soap*.

For Sale: 1 — Proctor & Schwartz 4-section Soap Chip Dryer, with 5 roll Houchin Cooling Rolls; 1—Pkge. Mach. Co. N-1 Laundry & Toilet Bar wrapping machine; 1—Houchin hand soap slabber; 1—3500 lb. vertical jacketed crutcher, m.d., 1—Houchin 4-roll inclined Granite Mill, 18" x 30" rolls, pulley drive; 2—Jones vertical type B, toilet soap presses; 3—Houchin 3" soap strainers; 50-1200 lb. soap frames; 2—Sperry 36" x 36" recessed filter presses, 60 plates; 1—Dopp cast iron 600 gallon jacketed kettle; 1—Allbright-Nell 4' x 9' Chilling Roll. Only a partial list. Send us your inquiries. Consolidated Products Co., Inc., 15-21 Park Row. New York 7, N. Y., Barclay 7-0600. Cable address: Equipment, N. Y.

For Sale: Packaging Machine and Pneumatic Seals, No. 10067-8. Made by Pneumatic Scale Corporation. Complete. Lehman Mill, three-roll, vertical type. Complete. Proctor & Schwartz, five-roll, 59"x12" Flaking unit, rolls in excellent condition. Address Box 162, c/o *Soap*.

For Sale: Allbright-Nell 4'x9' chilling rolls. Lehman 4-roll W.C. 12"x36" steel mill. Houchin 8½"x16" 3-roll & 18"x30". 4—roll Granite Stone Mills. Anderson No. 1 expellers. Jack. Kettles & Tanks, iron, copper, stainless & alum. Dryers vac. & atmos. Jones automatic soap presses. Soap frames. Automatic soap chip dryer. Slabbers & cutting tables hand & power. Crutchers. Blanchard #14 soap powder mill. 6 knife chipper. Foot presses. Filter presses 12" to 42". Wrapping & sealing machines. Powder, paste & liquid mixers. Filling machines. Grinders. Hammer mills. Colloid mills. Three roll steel mills, 3"x9", 9"x32", 12"x30" & 16"x40". Portable elec. agitators, pumps, etc. Send for Bulletin. We buy your surplus equipment. Stein Equipment Co., 90 West St., New York 6, N. Y. WOrth 2-5745.

Representative Wanted: To sell laboratory tested and approved mechanical and hand dishwashing compound. Can be handled as sideline by man now calling on the trade. Territory unlimited. Liberal commission. Address Box 170, c/o *Soap*.

Heads Mathieson Research

The appointment of L. Kermit Herndon, professor of chemical engineering at Ohio State University, as director of research for Mathieson Chemical Corp., Baltimore, was announced recently.

SOCMA-MCA Spring Outing

A spring outing, to be held jointly with the Manufacturing Chemists Association, is to be held Monday to Wednesday, June 19-21, at the Hotel Monmouth, Spring Lake, N. J., it was announced recently by the Synthetic Organic Chemical Manufacturers Assn. In addition to business meetings of both associations on the first day, there will be golf and other sports on the second day, on the evening of which a banquet will be held. The SOCMA committee on arrangements consists of B. M. Van Cleve, of Sherwin-Williams Co., New York, chairman; Victor E. Williams, of Monsanto Chemical Co., New York, and S. Stewart Graff, SOCMA secretary.

Remaining luncheon meetings for 1950, all to be held at the Hotel Commodore, New York, have been scheduled for Mar. 14, Apr. 12, Sept. 13, Oct. 11 and Nov. 8. The annual meeting and dinner will be held on December 13.

Ungerer Announces Shifts

The appointment of G. R. Nottingham of Atlanta as the company's southern sales representative to succeed Ira Bennett, who has been transferred to the company's New York office, was announced recently by Ungerer & Co., New York.

ICI Seeks A. Hoffman

An offer to acqure a controlling interest in Arnold, Hoffman & Co., Provdience, was announced recently by Imperial Chemical Industries, Ltd., of England. Arnold, Hoffman has an issued capital of approximately $930,000, consisting of approximately 93,000 shares of common stock having a par value of $10. The price offered by Imperial Chemical Industries is $55 per share.

FDA Hearings Continue

Insecticide residues on fruits comprised the main testimony of the resumed hearings on spray residue tolerance being conducted by the Federal Food and Drug Administration, Washington, D. C. The hearings resumed Feb. 13, after a recess of two weeks.

Doyle Succeeds Herzog

Charles E. Doyle has been elected to succeed the late Louis Herzog as president of Riddiford Brothers, Inc., Chicago janitor supply firm. Mr. Herzog died at his home in Chicago, Jan. 16, at the age of 79. A former president of the National Sanitary Supply Association, he is survived by a son, Dr. Robert S. Herzog; two sisters, and a brother.

Other officers of Riddiford Brothers include: vice-president and secretary, Burton E. Hillstrom; vice president, Max Bloomstein, Jr.; assistant secretary, Miss Dorothy McKeown; treasurer, Dr. Robert S. Herzog.

Columbia Chemical Co., Chicago, has added an aerosol bomb type glycol air deodorizer and sanitizer to its line of equipment for dispensing triethylene glycol vapors. The 12-ounce dispensing unit is made by American Can Co., New York. Other units in the Columbia line can be used for room or building size installations.

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TALE ENDS

BRACE your feet, old-timers in the soap racket. The young squirts are gradually infiltrating and taking over the industry. Al Peck, prez of Pecks Products in St. Louis is the latest member of the "younger set" to be elected on the board of the AASGP, which is short for the Soap Association. Vim and vigor! Ah, youth! But in Philadelphia, we note that Samuel Fels at 90 still stands firm and strong as the head man of Fels & Co. To both, our congratulations!

• • •

Were you one of the lucky ones who had the privilege of attending the Jefferson-Jackson Day dinner in Washington last month at 100 smackers per plate? We hear that one or two raw materials suppliers to the soap industry simply could not resist the strong appeal of the sales argument presented to them—and coughed up for tickets!

• • •

After the spectacular job by Gold Seal Co. of Bismarck, N. D. in putting across "Glass Wax" a couple of years ago, their entry in a big way into the self-polishing floor wax field is not too surprising. But, we predict that here they will have a tougher row to hoe. "Glass Wax" took the market by surprise, but with a floor wax it's different where so many successful brands are already very firmly entrenched.

• • •

Jim Wheeler, prez of Essential Chemicals, out Milwaukee way, picked this one up recently. A box of American soap powder was included among some gifts sent to a Maryknoll Mission in China, according to Father Francis Murphy in charge. But the Chinese nuns thought the soap powder was a new American breakfast food and tried some. They were not too well for a day or so, but got a big kick out of their mistake when told what it was they had eaten. Maybe the manufacturer is missing a bet here. . . . "our soap looks good enough to eat!"

• • •

The Breck shampoo folks of Springfield, Mass. have pulled a new one in billboard advertising of their well-known products out on the west coast. In Los Angeles, a painted billboard stays only one month in any location. Instead of painting a new advertisement, the whole works are moved bodily to a new location. Why not just put the billboard on a couple of trucks and drive it around all the time like the posters on the express trucks?

• • •

The pay-off trade name for a liquid soap has been filed by Towsley, Incorporated, of Indianapolis. "Three Little Squirts." Must be good stuff! Most of the alleged liquid soaps we find in public dispensers around here require about three-times-three squirts and even then are nothing to write home about.

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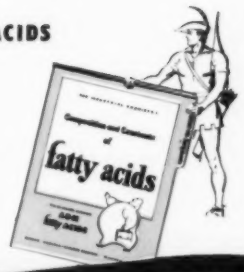

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